SONY

DIGITAL VIDEOCASSETTE RECORDER

DNW-75/75P

BETACAM SX

MAINTENANCE MANUAL
Volume 1 1st Edition
Serial No. 10001 and Higher: DNW-75
Serial No. 40001 and Higher: DNW-75P

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

Attention-when the product is installed in Rack:

1. **Prevention against overloading of branch circuit**
   When this product is installed in a rack and is supplied power from an outlet on the rack, please make sure that the rack does not overload the supply circuit.

2. **Providing protective earth**
   When this product is installed in a rack and is supplied power from an outlet on the rack, please confirm that the outlet is provided with a suitable protective earth connection.

3. **Internal air ambient temperature of the rack**
   When this product is installed in a rack, please make sure that the internal air ambient temperature of the rack is within the specified limit of this product.

4. **Prevention against achieving hazardous condition due to uneven mechanical loading**
   When this product is installed in a rack, please make sure that the rack does not achieve hazardous condition due to uneven mechanical loading.

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

Vorsicht!

Explosionsgefahr bei unsachgemäßem Austausch der Batterie.

Ersatz nur durch denselben oder einen vom Hersteller empfohlenen ähnlichen Typ.
Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.
Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

ADVARSEL!

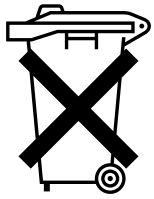
Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

Voor de klanten in Nederland

Dit apparaat bevat een $(CF)_n$-Li batterij voor memory back-up.

Raadpleeg uw leverancier over de verwijdering van de batterij op het moment dat u het apparaat bij einde levensduur afdankt.

Gooi de batterij niet weg. maar lever hem in als KCA.



Bij dit produkt zijn batterijen geleverd. Wanneer deze leeg zijn, moet u ze niet weggooien maar inleveren als KCA.

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Manual Structure

Purpose of this manual

This manual is the Maintenance manual volume 1 of digital videocassette recorder DNW-75/75P.

This maintenance manual (Volume 1, 2, and 3) is intended for use by trained system and service engineers, and provides the information of maintenance and detailed service (parts replacement, guideline for adjustment, schematic diagrams, board layouts, detailed parts list).

This manual (volume 1) explains about maintenance information, parts replacement, and guideline for adjustment.

Related manuals

Besides this “Maintenance manual”, the following manuals are available for digital videocassette recorder DNW-75/75P.

- **Operation Manual (Supplied with the DNW-75/75P.)**
  This manual is necessary for application and operation (and installation) of the DNW-75/75P.

- **Installation Manual (Supplied with the DNW-75/75P.)**
  This manual describes the information on installing the DNW-75/75P.

- **Protocol Manual of Remote (9-pin) Connector (available on request)**
  This manual explains the protocol for controlling the VTR via the RS-422A (9-pin serial remote) . If this manual is required, please contact your local Sony Sales Office/Service Center.

- **Interface Manual of Parallel I/O (50-pin) Connector (available on request)**
  This manual explains the protocol for controlling the VTR via the parallel (50-pin). If this manual is required, please contact your local Sony Sales Office/ Service Center.

- **“Semiconductor Pin Assignments” CD-ROM (Available on request)**
  This “Semiconductor Pin Assignments” CD-ROM allows you to search for semiconductors used in Broadcasting & Professional Systems Company equipment.
  Semiconductors that cannot be searched for on this CD-ROM are listed in the maintenance manual for the corresponding unit. The maintenance manual contains a complete list of all semiconductors and their ID Nos., and thus should be used together with the CD-ROM.
  Part number: 9-968-546-XX

Contents

This maintenance manual (volume 1, volume 2, and volume 3) is organized by following sections.

Maintenance manual volume 1 (9-967-869-)

Section 1 Service Overview
Explains fundamental area of the information that is required to service, (removal of cabinet and cassette compartment, the functions of printed circuit board, the locations of main part, fixture and measuring equipment information, notes, etc.), the measures against trouble, error messages, and ISR (Interactive Status Reporting).

Section 2 Periodic Maintenance and Inspection
Explains the recommended periodic maintenance, the cleaning procedure and the video head tip protrusion check procedure.

Section 3 Maintenance Mode
Explains each menu of the maintenance mode.

Section 4 Electrical Alignment
Explains the electrical alignment for the maintenance of this unit.

Section 5 Replacement of Main Parts
Explains the replacement of mechanical parts, power supply unit, and circuit boards.

Section 6 Tape Path Alignment
Explains the tape path alignment after replacement of parts that are described in Section 5.

Section 7 Electrical Alignment after Main Parts Replacement
Explains the electrical alignment associated with replacement of parts that are described in Section 5.

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Maintenance manual volume 2 (9-967-870-)

Section 1 Service Overview
Describes the notes on repair parts.

Section 2 Exploded Views
Describes the exploded views and the mechanical parts list (including some electrical parts).

Section 3 Electrical Parts List
Describes the electrical parts list of each board (including some mechanical parts). Moreover, describes the electrical parts list (frame electrical parts list) except on the board.

Section 4 Packing Materials and Supplied Accessories List
Describes the packing materials and the supplied accessories list.

Section 5 Power Cords List
Describes the recommended power cords list.

Section 6 Optional Fixtures List
Describes the optional fixtures and maintenance articles list.

Maintenance manual volume 3 (9-967-871-)

Section 1 Semiconductor Pin Assignments
This section contains information on semiconductors used for unit.
It includes a complete list of the semiconductors and their ID Nos. for retrieving information on “Semiconductor Pin Assignments” CD-ROM, which is available separately.
Please refer to this section together with the “Semiconductor Pin Assignments” CD-ROM.
Information on the semiconductors not contained in the CD-ROM at the time of issue of this manual, if any, is given in this section as well.

Section 2 Block Diagrams
Describes the circuit description and the block diagrams of overall and each board.

Section 3 Schematic Diagrams and Frame Wiring
Describes the frame wiring and the schematic diagrams for the unit.

Section 4 Board Layouts
Describes the board layouts for the unit.

Section 1
Service Overview

1-1. Notes on Power Supply Block

1-1-1. Warning on Primary Circuit Block and Electric Shock

WARNING

The primary circuit consists of the AC-169 board with AC inlet, the circuit breaker, the POWER switch, and the power supply unit.
Be careful not to receive an electric shock when performing the maintenance and service works with the power turned on.
A primary voltage remains applied to the AC-169 board, circuit breaker, and POWER switch even if the POWER switch is turned off. For the work that requires no current conduction, therefore, turn off the POWER switch and disconnect the power cord.

1-1-2. Note on Resetting the Circuit Breaker

The circuit breaker of a primary circuit is mounted on the power panel of this unit. When an overcurrent flows in the primary circuit, the breaker operates and the button protrudes.
If the breaker operates, eliminate the cause for which an overcurrent flows, then push the button.

1-2. Cleaning when the Heads are Clogged

Clean using a cleaning cassette tape (specified product: BCT-5CLN) when the video heads are clogged.
For the cleaning, refer to “2-2-1. Cleaning by Cleaning Tape”.

WARNING

Clean the video heads in the prescribed procedure using a specified cleaning cassette tape. If not, the video heads may be abrasive or damaged.

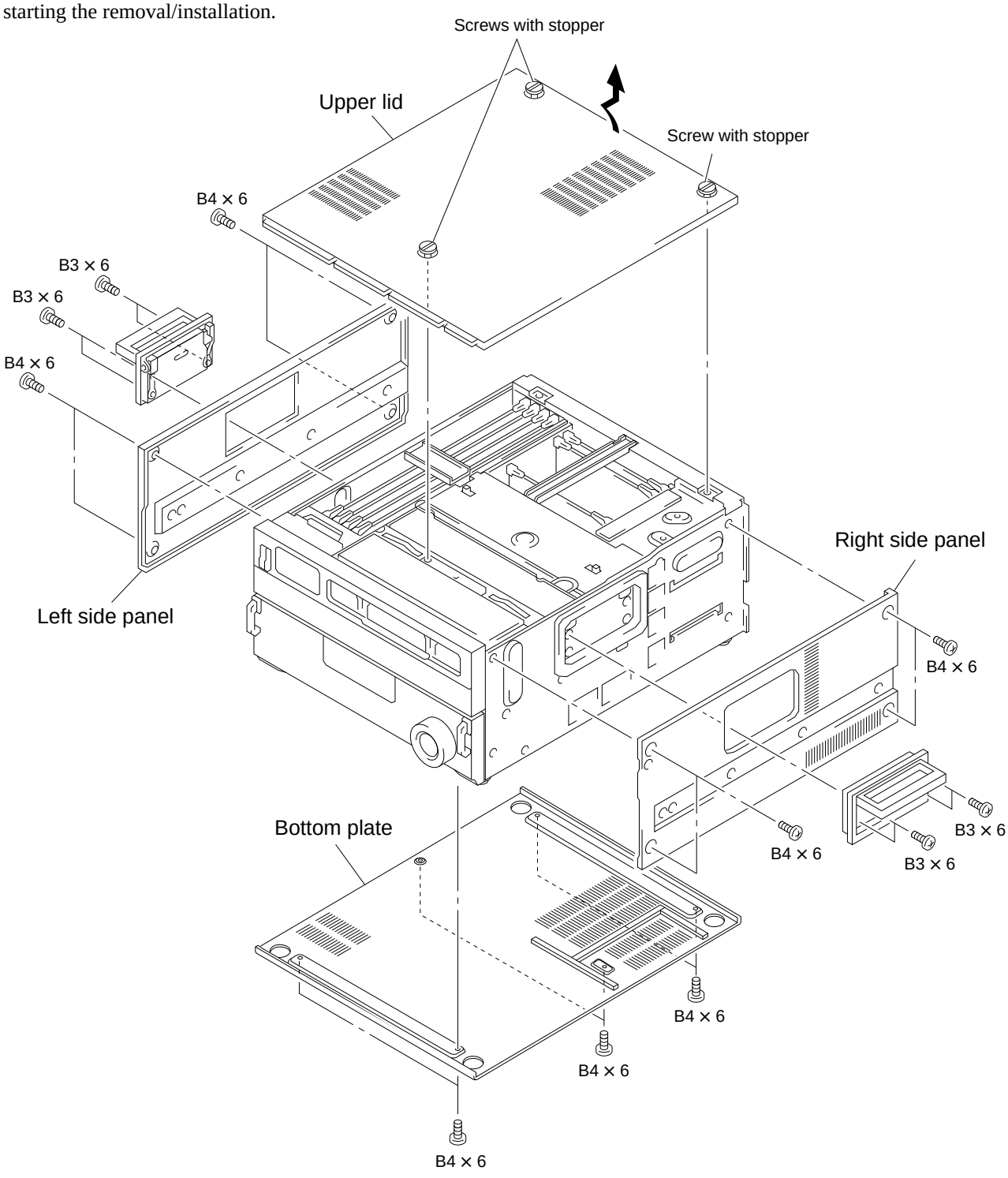
If the head clogging is not solved using a cleaning cassette tape, use cleaning cloth.
For the cleaning using a cleaning cloth, clean according to the procedure of “2-2-3. Tape Running Surface of Upper Drum and Video Heads Cleaning” after confirming the cautions and preparation in “2-2-2. General Information for Cleaning with Cleaning Cloth”.

1-3. Removal/Installation of Cabinet

1-3-1. Upper Lid, Side Panels, and Bottom Plate Removal/Installation

Note

Turn off the power and unplug the power cord before starting the removal/installation.



Upper Lid

1. Loosen the three fixing screws.
2. Remove the upper lid by moving in the direction indicated by the arrow.

For installation, perform in the reverse procedures of removal.

Side Panels

(The right and left side panels are the same in procedure.)

1. Remove the four screws (B3 × 6), and remove the handle.
2. Remove the four screws (B4 × 6), and remove the side panel.

For installation, perform in the reverse procedures of removal.

Bottom Plate

Note

With the handle attached, place the unit on its right side panel down for removal and installation. Lend your hand so that the lower handle does not hang down.

1. Remove the six screws (B4 × 6), and remove the bottom plate.

For installation, perform in the reverse procedures of removal.

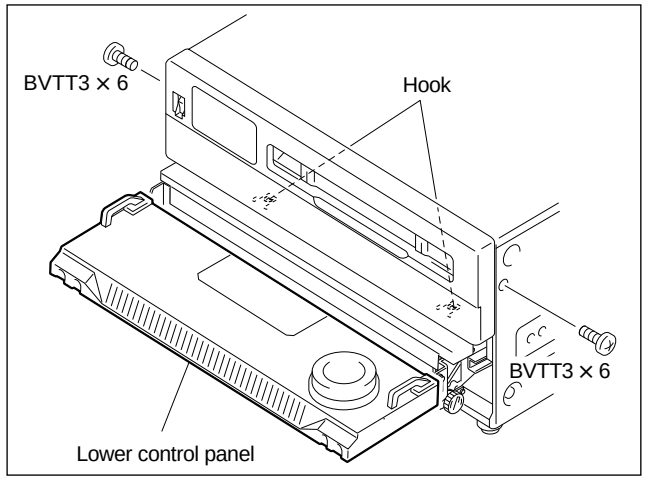
1-3-2. Control Panels Removal/Installation

Note

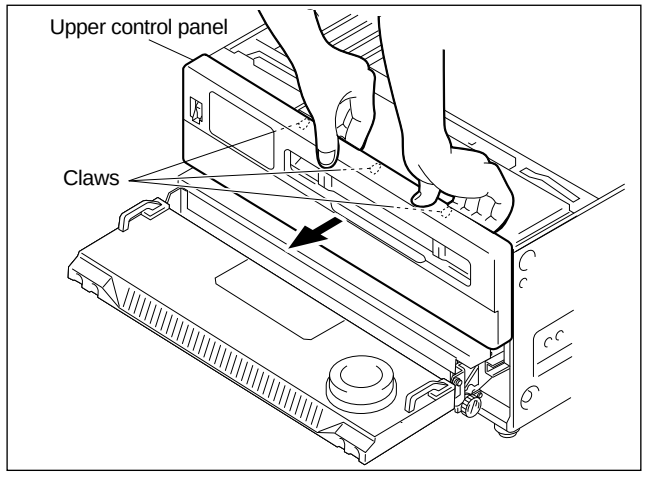
Turn off the power and unplug the power cord before starting the removal/installation.

Upper Control Panel

1. Remove the upper lid.
   (Refer to "1-3-1. Upper Lid, Side Panels, and Bottom Plate Removal/Installation".)
2. Remove the one screw each on the left and right sides.
3. Slightly pull the lower control panel forward, then pull it more strongly to tilt the lower control panel upward (to 90° position).
4. Unhook the two hooks at lower portion on the upper control panel.



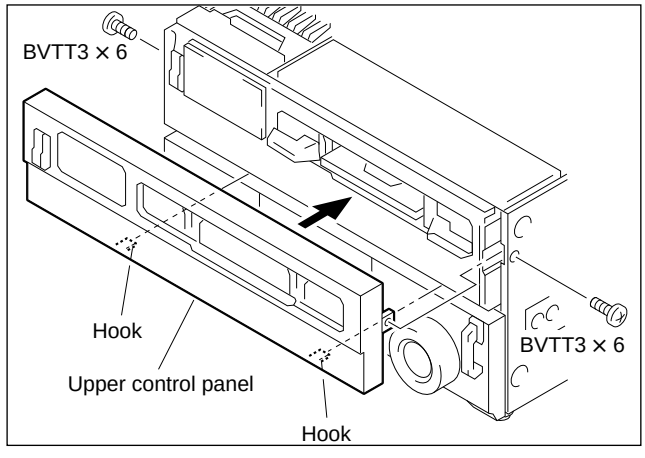
5. Unhook the claws at the upper control panel from the chassis, and remove in the direction of the arrow.



For installation, perform in the reverse procedures of removal.

Note

Insert the hooks at the back of the panel into the convex portions of the chassis, then install the panel in the chassis. (Refer to the figure below.)



Note

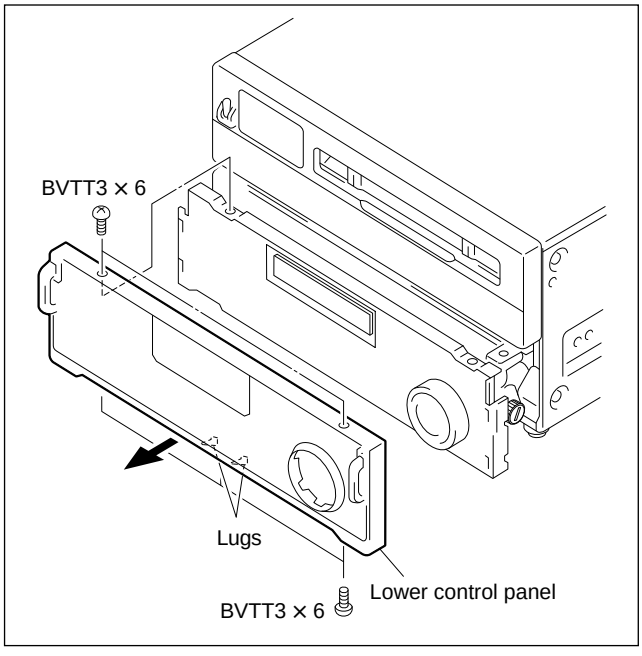
Turn off the power and unplug the power cord before starting the removal/installation.

Lower Control Panel

1. Slightly pull the lower control panel forward, then pull it more strongly.
2. Remove the five screws on the top and bottom of the lower control panel.

   Note

   Open the lower control panel to facilitate removing the screws at the bottom of the panel.
3. Remove the two lugs at the back of the lower control panel.
4. Remove the lower control panel in the direction of the arrow.



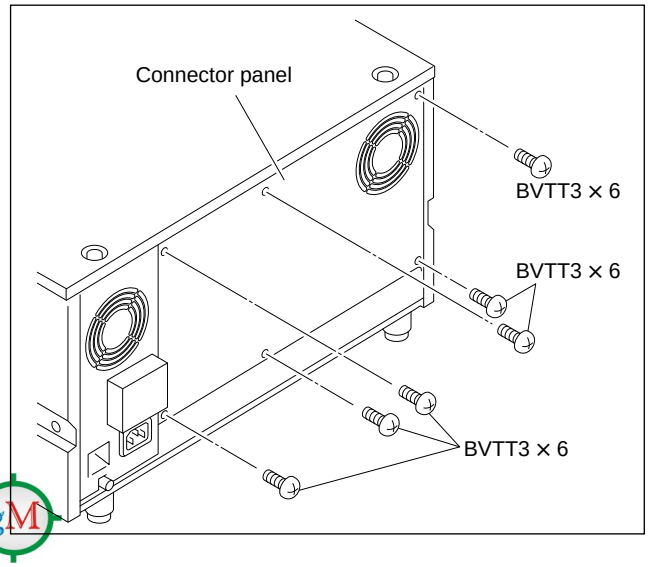
For installation, perform in the reverse procedures of removal.

1-3-3. Connector Panel Assembly Removal/ Installation

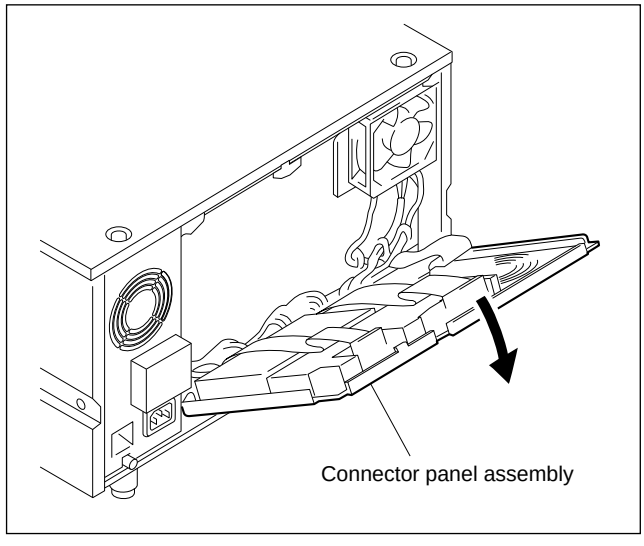
CAUTION

For your safety, turn off the power and unplug the power cord before starting the removal/installation.

1. Remove the six screws indicated ⇒ on the connector panel.



2. Being careful not to stretch the harnesses, remove the connector panel assembly as shown in the figure.



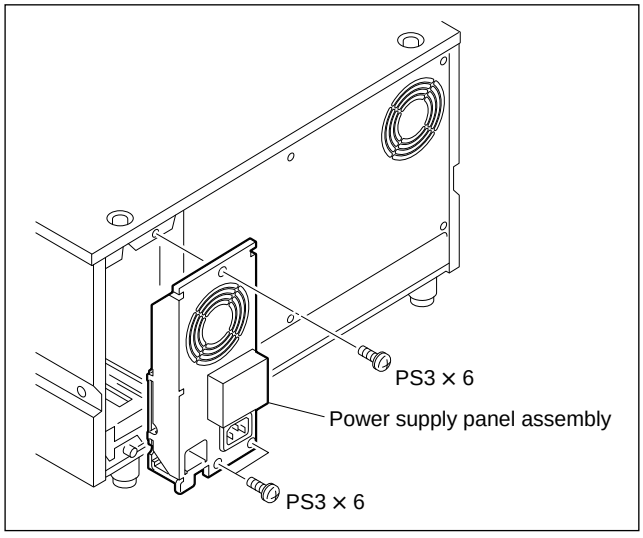
For installation, perform in the reverse procedures of removal.

1-3-4. Power Supply Panel Assembly Removal/Installation

CAUTION

For your safety, turn off the power and unplug the power cord before starting the removal/installation.

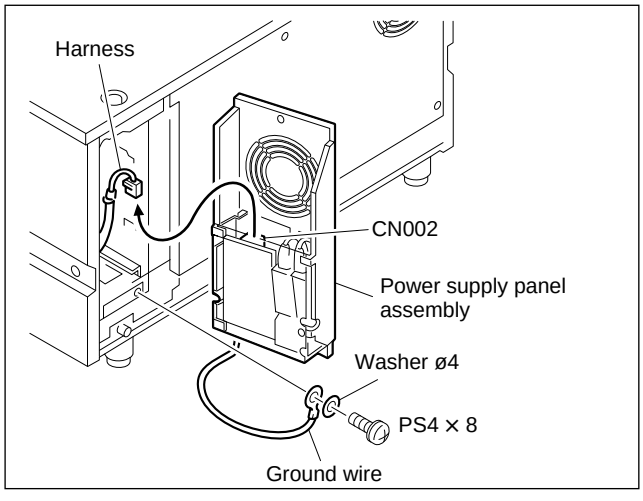
1. Remove the three screws, then pull the power supply panel assembly out.



2. Disconnect the harness from the connector (CN002) on the AC-169 board.
3. Remove the one screw fixing the ground wire to the chassis, then remove the power supply panel assembly.

Note

Be sure to remove the washer.



For installation, perform in the reverse procedures of removal.

Note

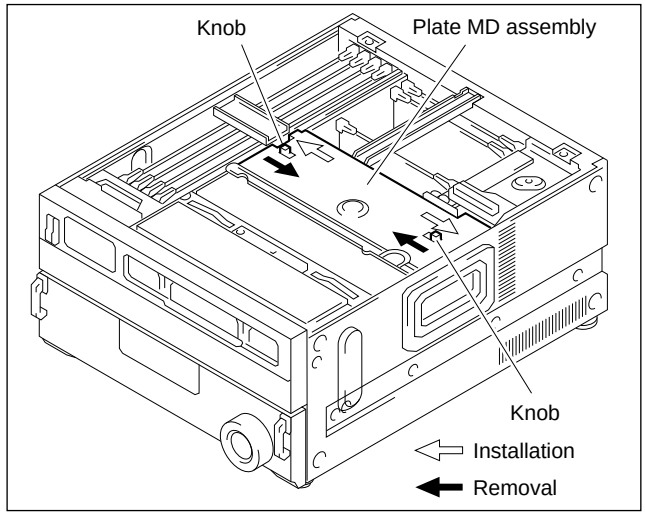
To fix the ground wire, put the washer between the terminal of ground wire and screw.

1-4. Plate MD Assembly Removal/ Installation

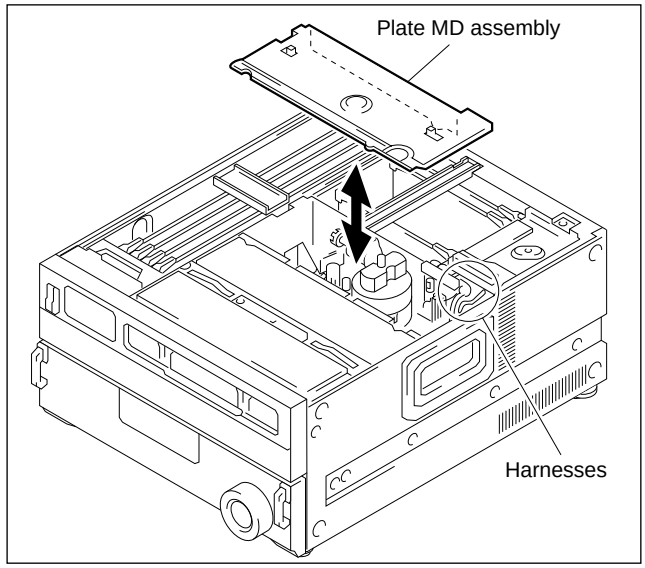
Note

Turn off the power and unplug the power cord before starting the removal/installation.

1. Remove the upper lid.
   (Refer to "1-3-1. Upper Lid, Side Panels, and Bottom Plate Removal/Installation".)
2. Slide the knobs on the plate MD assembly each in the inside. (Move the knobs to the outside to fix the plate MD assembly.)



3. Remove the plate MD assembly.



For installation, perform in the reverse procedures of removal.

Note

Be careful not to pinch the harnesses under the plate MD assembly in the installation.

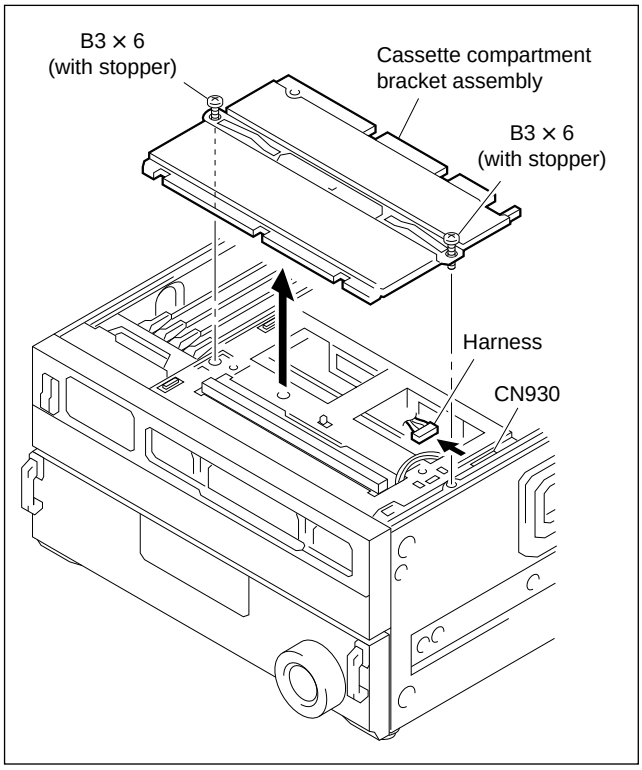
1-5. Cassette Compartment Removal/ Installation

Notes

- Turn off the power and unplug the power cord before starting the removal/installation.
- The cassette compartment cannot be removed with the cassette tape inserted. Press the EJECT button with the power turned on to eject the cassette tape.
  If the cassette compartment does not move due to an electric trouble, take out the cassette tape manually. (Refer to "1-12. Taking Out the Cassette in Tape Slacking".)

Removal

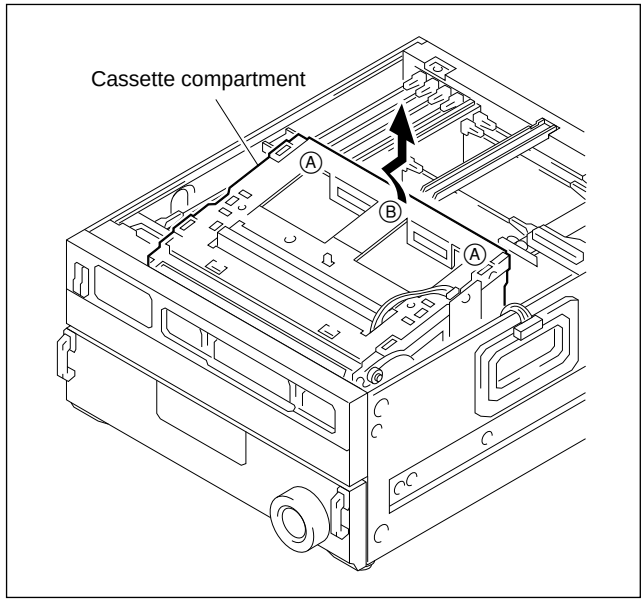
1. Remove the upper lid.
   (Refer to section "1-3-1. Upper Lid, Side Panels, and Bottom Plate Removal/Installation".)
2. Remove the plate MD assembly.
   (Refer to section "1-4. Plate MD Assembly Removal/ Installation".)
3. Loosen the two screws, then remove the cassette compartment bracket assembly.
4. Disconnect the harness from the connector (CN930) on the CL-29 board. Keep the harness out of the way of the removal.



5. Hold the cassette compartment at the portions Ⓐ and lift up the cassette compartment slightly (by 1 cm). When the four cassette compartment positioning legs come off from the four positioning holes on a mechanical deck, shift the cassette compartment backward (by 1 cm) to the position where the cassette lid can be completely seen when viewed from just above.
6. Hold the cassette compartment at the portions Ⓑ, then slowly raise the cassette compartment upward to remove it.

Notes

- Being careful not to contact the gear on the right of the cassette compartment with the chassis, slowly raise the cassette compartment while slightly sliding it back-and-forth.
- Never move the cassette compartment to the right and left. If unnecessary force is applied to right and left, the gear or part may come off.
- Place the cassette compartment with the cassette lid up or with cassette compartment positioning legs down.
  (If it is put with the cassette lid down, the flexible card wire/board might be damaged.)



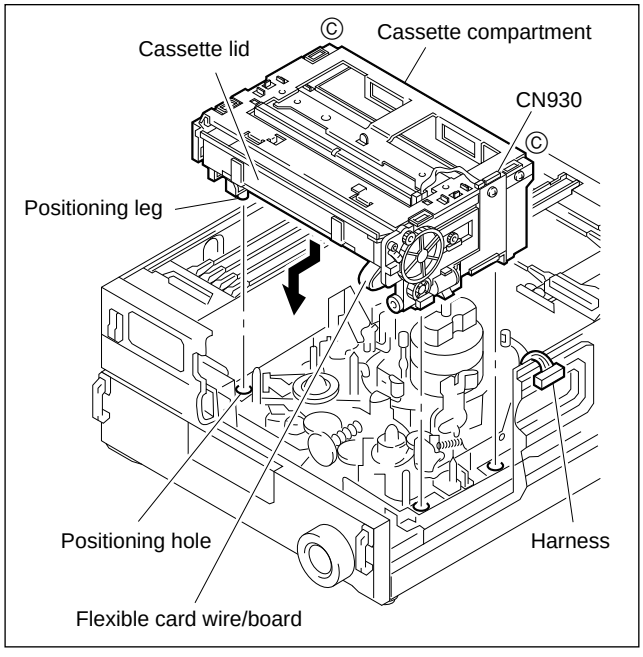
Installation

7. Place the cassette compartment into the unit in the direction as shown in the figure (with the cassette lid down).

Notes

- Being careful not to contact the gear on the right of the cassette compartment with the chassis, slowly insert the cassette compartment into the unit while slightly sliding it back-and-forth.
- Never move the cassette compartment to the right and left. If unnecessary force is applied to the right and left, the gear or part may come off.

8. Press the portions Ⓒ of the cassette compatment as shown in the figure, and then fit the four positioning legs into the four positioning holes in the mechanical deck.



9. Connect the harness to the connector (CN930) on the CL-29 board.
10. Reattach the cassette compartment bracket assembly.
11. Reattach the plate MD assembly and the upper lid.

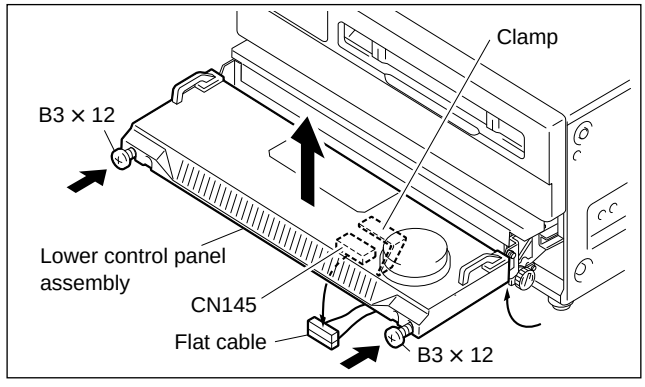
1-6. Lower Control Panel Assembly Removal/Installation

Note

Turn off the power and unplug the power cord before starting the removal/installation.

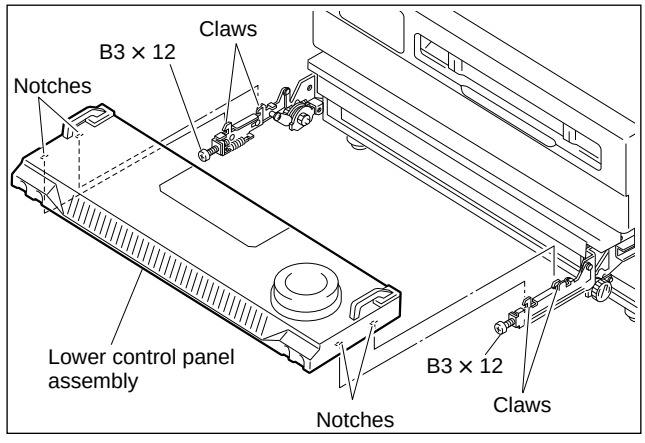
Removal

1. Slightly pull the lower control panel forward, then pull it more strongly to tilt the lower control panel upward (to 90˚ position).
2. Untie the flat cable from the clamp, then disconnect the flat cable from the connector (CN145) on the back of the lower control panel.
3. Loosen the two screws in bottom corners of the lower control panel assembly. (Loosen the screws until screw's top are exposed from the lack of the panel assembly.)
4. Push the loosened screws in the direction indicated by the arrow and raise the lower control panel assembly.



Installation

5. Set the notches of the panel assembly to the claws of the arms and insert the panel assembly until making a click sound.
6. Fix the lower control panel assembly with two screws.



7. Connect the flat cable to the connector (CN145), then tie the cable with the clamp.
8. Return the lower control panel to 0˚, then store.

1-7. Circuit Function

System configuration	No.	Board name	Circuit function
Digital process	①	DPR-118	Digital data processor (Audio/Video processor)
	②	SDI-41	4:2:2 component serial digital interface with Embedded audio
Video process	③	*1 VPR-47	Video signal processor (D-A, Reference clock generator, Composite encoder)
	④	DEC-110	Analog composite decoder
Audio process	⑤	APR-40	Audio signal processor, AES/EBU interface
RF process	⑥	EQ-75	RF equalizer (REC current control, PB EQ, Inner error correction)
System/servo control	⑦	*1 SS-83	System control, Servo control
	⑧	*1 MS-58	Solenoids driver (Pinch, Brakes, Cleaning), Sensors input
	⑨	*1 DR-315	Motors driver (Drum, Capstan, Reels, Threading, Reel shift, Cassette up/down)
	⑩	TC-102	TC REC/PB circuit, TC/FULL erase OSC
Mech. deck driver/sensor	⑪	*1 SE-461	Connection board with Condensation sensor
	⑫	PTC-54	Threading FG
	⑬	CCM-15	Threading motor
	⑭	CCM-15	Reel shift motor
	⑮	PD-35	Pinch solenoid connection, Tape end sensor connection
	⑯	TR-79	T tension sensor, Threading-end and Unthreading-end sensors
	⑰	PTC-59	Cassette's holes sensor
	⑱	RM-181	T reel motor
	⑲	SE-344	T reel FG
	⑳	RM-181	S reel motor
	㉑	SE-344	S reel FG
	㉒	PTC-71	Reel position sensors
	㉓	TR-78	S tension sensor

*1: The full name of each mounted board is as follows:

Model name	VPR-47	SS-83	MS-58	DR-315	SE-461
DNW-75	VPR-47	SS-83E	MS-58E	DR-315K	SE-461E
DNW-75P	VPR-47P	SS-83E	MS-58E	DR-315K	SE-461E

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System configuration	No.	Board name	Circuit function
Cassette compartment	㉔	CL-29	Cassette up/down motor, Cassette down sensors
	㉕	LP-81	Lamp of cassette compartment
	㉖	PC-70	Cassette-in sensors, Cassette size sensor
Front panel	㉗	FP-117	Panel function (Switches, LEDs) control, CAV control level conversion
	㉘	*2 VR-223	Audio REC level VRs, Video input level VR, Phone level VR, Phone connector
	㉙	*2 VR-224	Audio PB level VRs
	㉚	SWC-35	Upper control panel function (Switches, LEDs)
	㉛	*2 SWC-31	Sub control panel function
	㉜	KY-438	Lower control panel function
	㉝	PTC-69	Search dial sensor, Dial solenoid connection
Motherboard, connector panel	㉞	*2 MB-818	Motherboard, Remote control connectors (REMOTE1 (9P), RS-232C, VIDEO CONTROL, CONTROL PANEL)
	㉟	CP-334	Connector board (Analog video) with input/output buffer
	㊱	*2 CP-278	Connector board (Analog audio input/output)
	㊲	CP-335	Connector board (AES/EBU input/output)
	㊳	*2 CP-301	Connector board (TC input/output, MONITOR output)
	㊴	RM-130	Parallel (50-pin) remote interface, Remote control connector [REMOTE 2 PARALLEL (50P)]
	㊵	RM-179	NV-RAM for Parallel (50-pin) remote interface
Power	㊶	*2 AC-169	AC connector board with Breaker
	㊷	PS unit	Switching regulator (PS=Power supply)
Option	㊸	DPR-119	SDTI output interface (optional kit BKNW-118)
	㊹	DPR-120	SDTI input interface (optional kit BKNW-117)

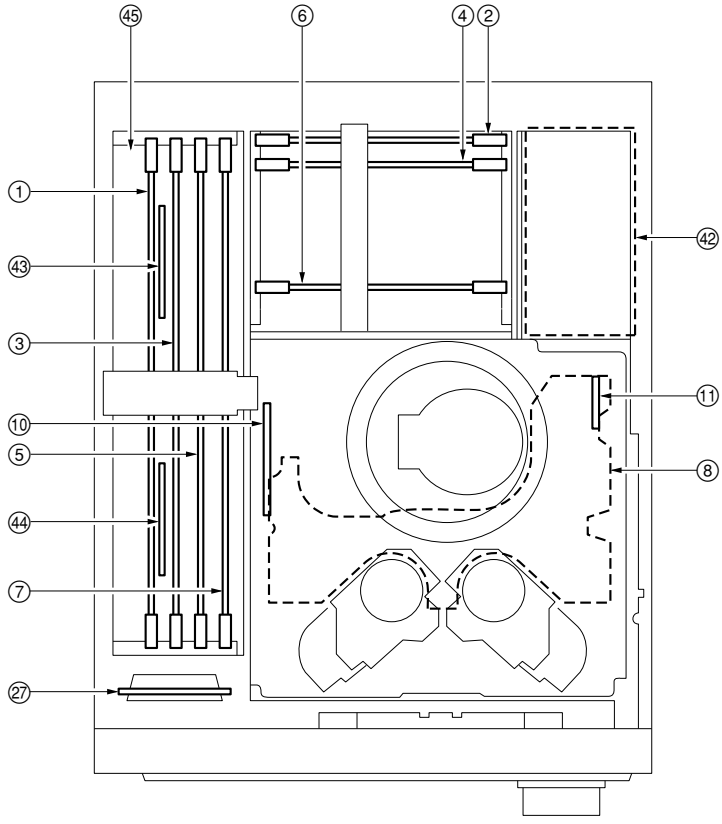
*2: The full name of each mounted board is as follows:

Model name	VR-223	VR-224	SWC-31	MB-818	CP-278	CP-301	AC-169
DNW-75	VR-223K	VR-224K	SWC-31M	MB-818E	CP-278K	CP-301K	AC-169K
DNW-75P	VR-223K	VR-224K	SWC-31M	MB-818E	CP-278K	CP-301KP	AC-169K

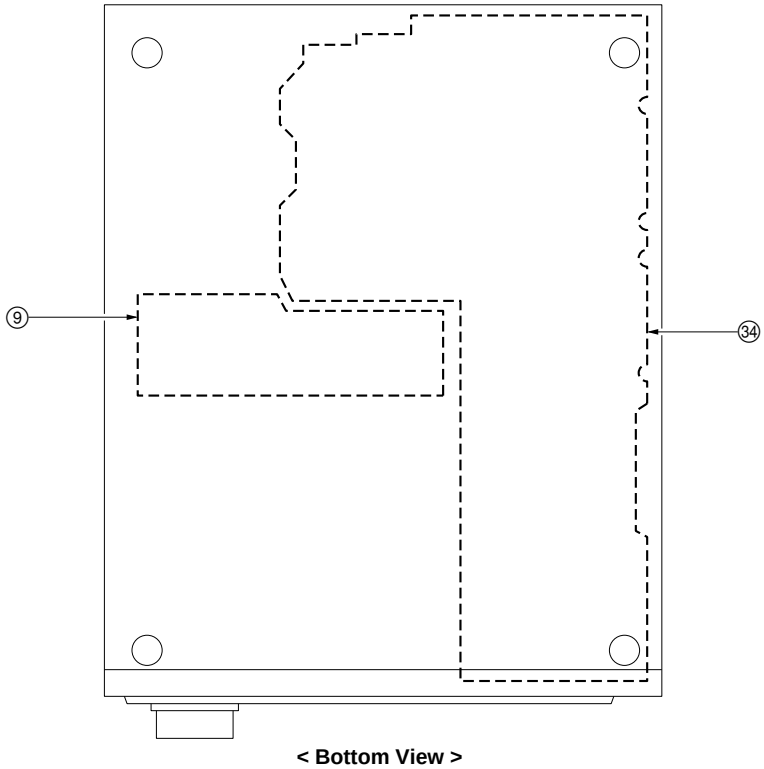
1-8. Location of Main Parts

1-8-1. Printed Circuit Boards and Power Supply Unit Locations

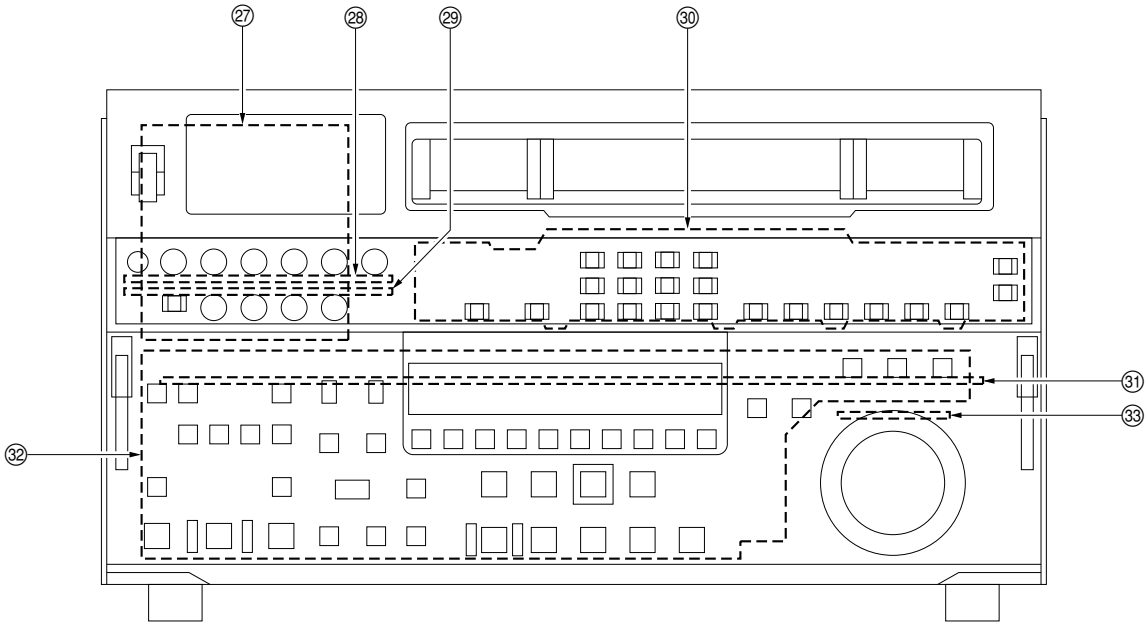
AC-169 ..... ㊶
APR-40 ..... ⑤
CCM-15 ..... ⑬ ⑭
CL-29 ..... ㉔
CP-278 ..... ㊱
CP-301 ..... ㊳
CP-334 ..... ㉟
CP-335 ..... ㊲
DEC-110 ..... ④
DPR-118 ..... ①
DPR-119 ..... ㊸ (BKNW-118)
DPR-120 ..... ㊹ (BKNW-117)
DR-315 ..... ⑨
EQ-75 ..... ⑥
FP-117 ..... ㉗
KY-438 ..... ㉜
LP-81 ..... ㉕
MB-818 ..... ㉞
MS-58 ..... ⑧
PC-70 ..... ㉖
PD-35 ..... ⑮
PTC-54 ..... ⑫
PTC-59 ..... ⑰
PTC-69 ..... ㉝
PTC-71 ..... ㉒
RM-130 ..... ㊴
RM-179 ..... ㊵
RM-181 ..... ⑱ ⑳
SDI-41 ..... ②
SE-344 ..... ⑲ ㉑
SE-461 ..... ⑪
SS-83 ..... ⑦
SWC-31 ..... ㉛
SWC-35 ..... ㉚
TC-102 ..... ⑩
TR-78 ..... ㉓
TR-79 ..... ⑯
VPR-47 ..... ③
VR-223 ..... ㉘
VR-224 ..... ㉙
Power supply unit ... ㊷
Reserved slot ..... ㊺



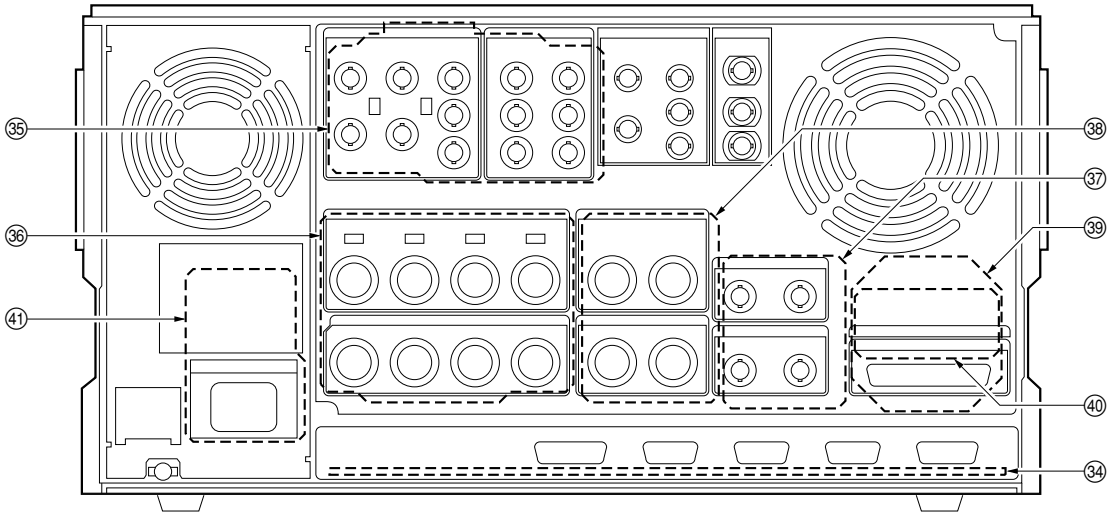
< Top View >



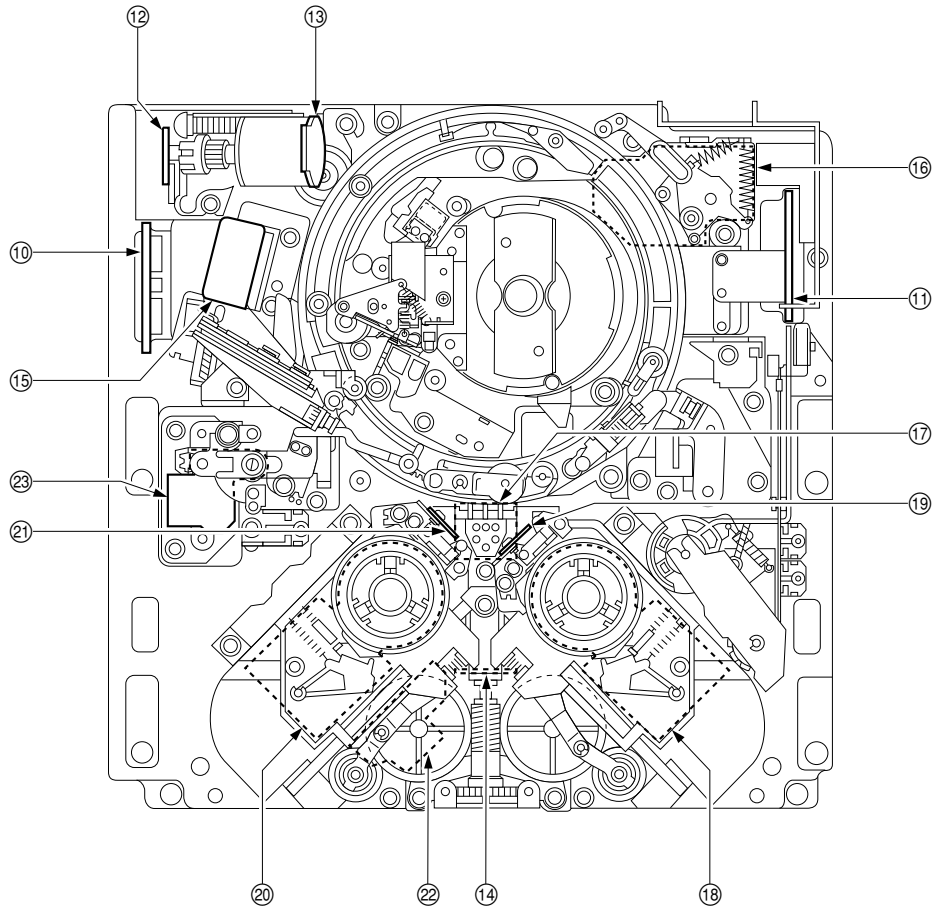
< Bottom View >



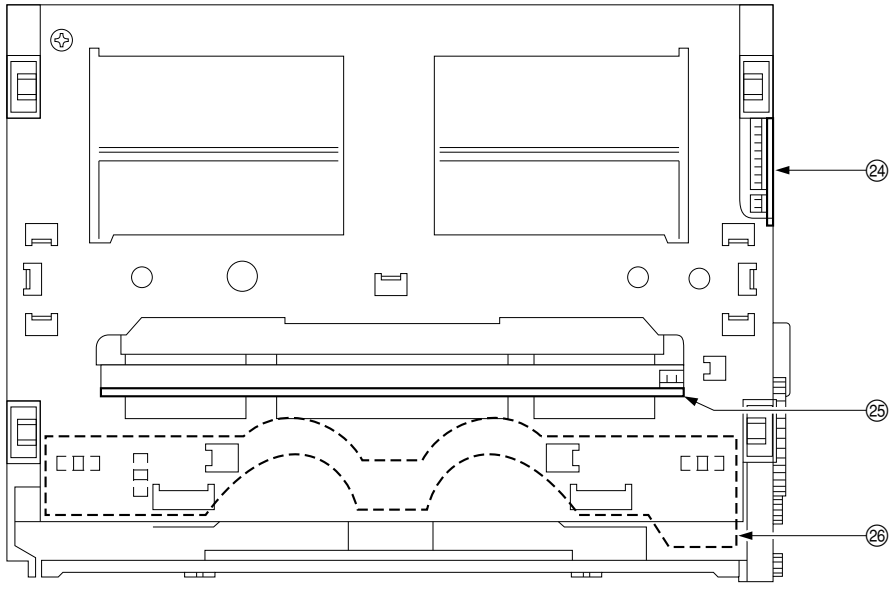
< Front View >



< Rear View >

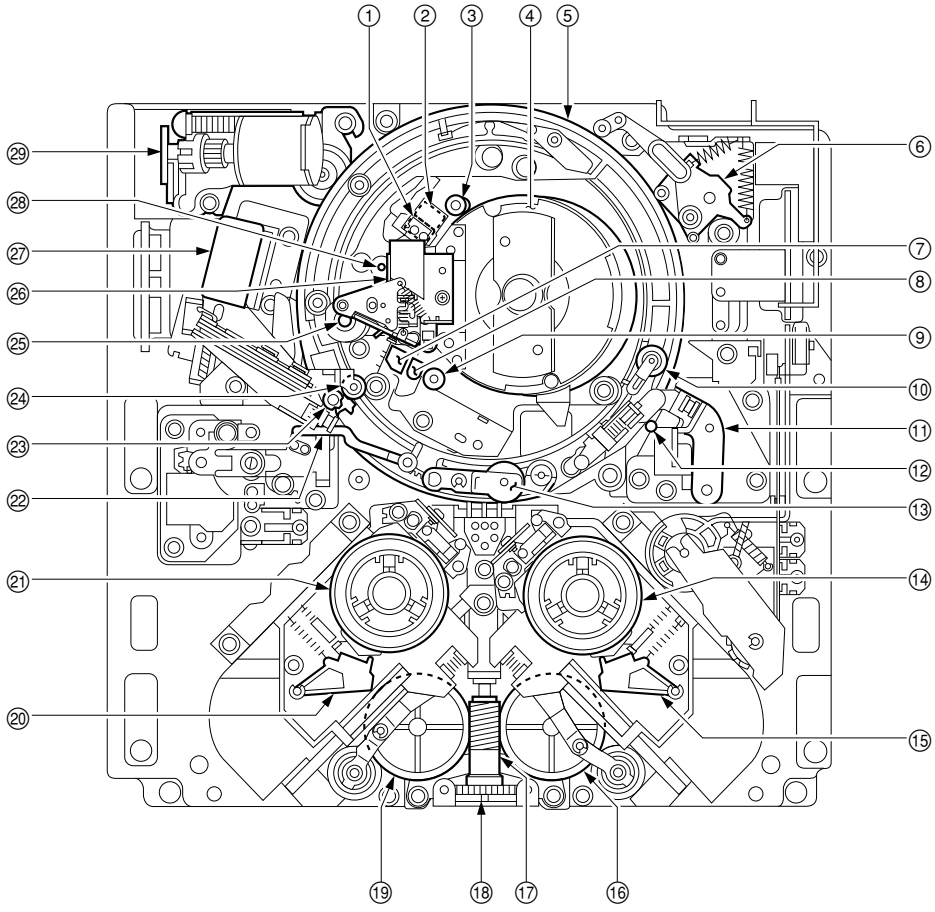


< Top View of Mechanical Deck >



< Top View of Cassette Compartment >

1-8-2. Main Mechanical Part Locations

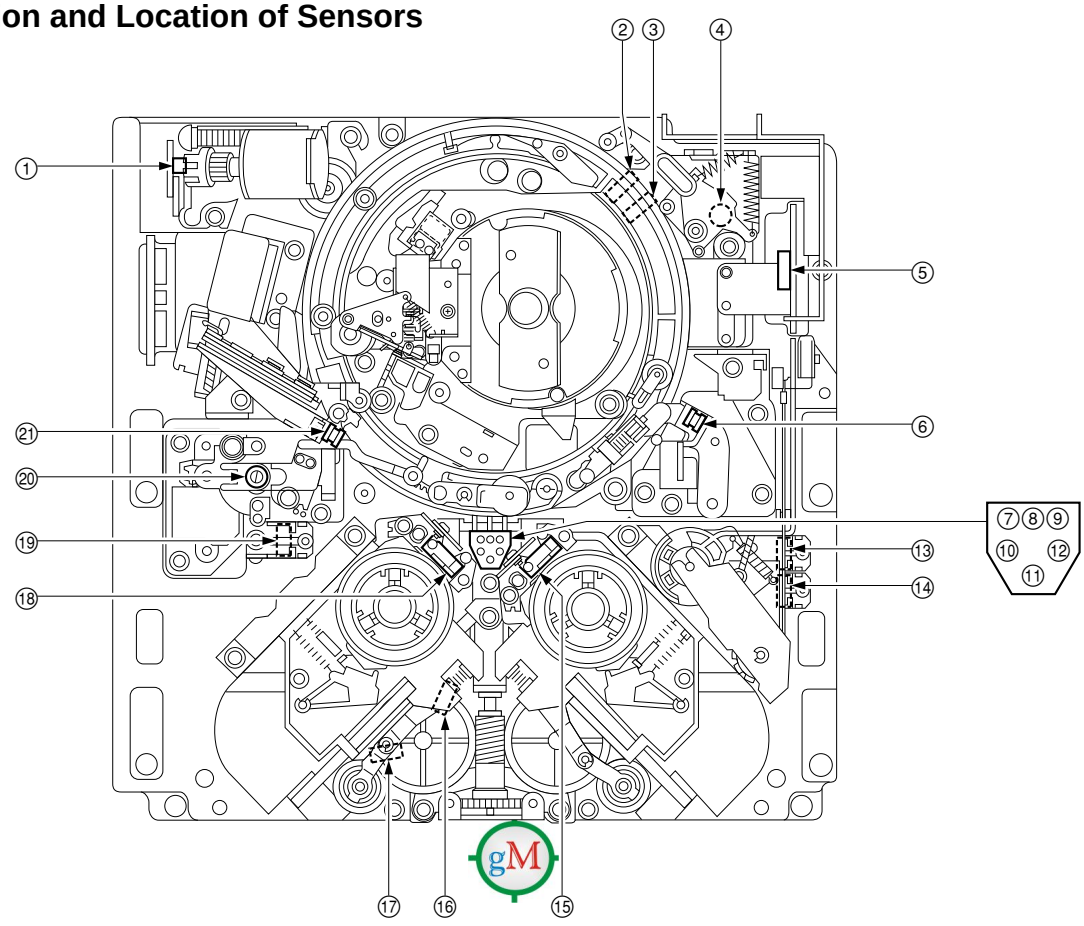


< Top View of Mechanical Deck >

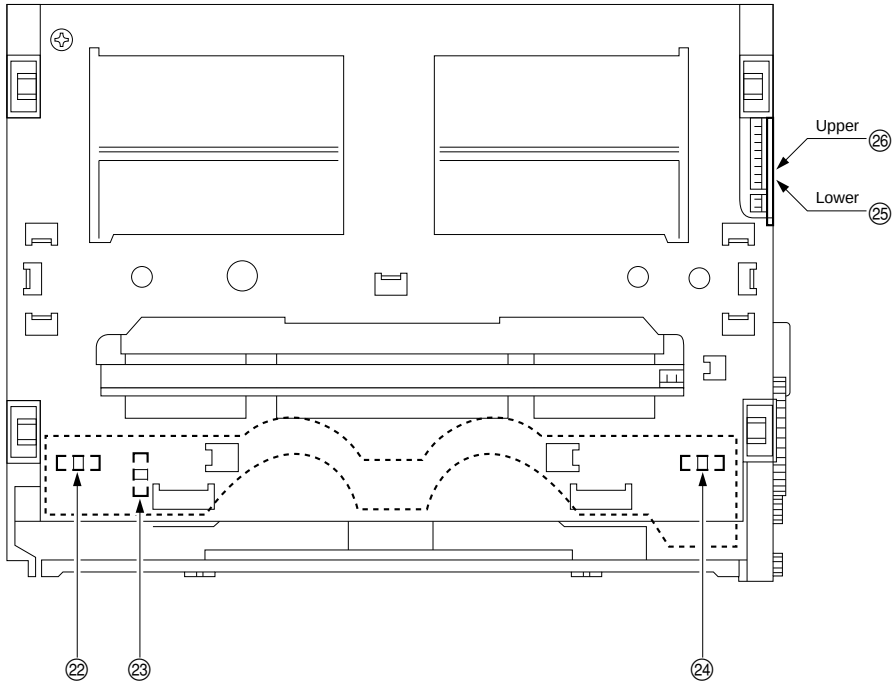
INDEX

① Audio/TC head
② Audio/TC erase head
③ TG-3 tape guide
④ Head drum
⑤ Threading ring
⑥ T tension regulator arm
⑦ Full-erase head
⑧ CTL head
⑨ TG-2 tape guide
⑩ Audio/TC head cleaner
⑪ T drawer arm
⑫ TG-10 tape guide
⑬ Pinch roller
⑭ T reel table
⑮ T brake assembly
⑯ T worm wheel
⑰ Worm gear
⑱ Drive gear
⑲ S worm wheel
⑳ S brake assembly
㉑ S reel table
㉒ S tension regulator
㉓ Tape cleaner
㉔ TG-0 tape guide
㉕ Capstan shaft
㉖ Cleaning roller block
㉗ Pinch press block
㉘ TG-4 tape guide
㉙ Threading gear block

1-9. Function and Location of Sensors



< Top View of Mechanical Deck >



< Top View of Cassette Compartment >

① **Threading motor FG sensor**
This sensor detects the rotation speed of the threading motor. The output signal of this sensor enters the threading motor servo circuit, and controls the threading/unthreading speed to protect the tape during threading and unthreading operation.

② **Unthreading-end sensor**
③ **Threading-end sensor**
These sensors detect whether the threading ring reaches the threading-end or unthreading-end position.

④ **T tension regulator arm sensor**
This sensor detects the position of a T tension regulator arm. During recording and playback, the output signal of this sensor enters the T reel motor servo circuit, and controls the reel torque to keep a constant T tape tension.

⑤ **Condensation sensor**
This sensor detects whether the dew condensation occurs in the unit.

⑥ **Tape top sensor**
This sensor detects the beginning of the tape, and in addition detects the end of the tape that runs in the reverse direction.

⑦ **Reel hub diameter sensor**
This sensor detects the reel hub diameter detection tab of a cassette.
The reel hub with two types of diameters (thin and thick) is available according to the length of a tape stored in a cassette. This sensor is used to discriminate the diameter. The output signal of this sensor enters the servo circuit of take-up and supply reel motors, and controls the reel rotation speed and torque during tape transport.

⑧ **Metal/oxide tape sensor**
This sensor detects the metal tape detection tab of a Betacam/Betacam SP cassette.
This sensor is used to discriminate whether the tape stored in a Betacam/Betacam SP cassette is an oxide tape or metal particle tape.
When the oxide tape, automatically ejects it.

⑨ **Tape thickness sensor**
This sensor detects the tape thickness detection tab of a cassette.
This sensor is used to discriminate the thickness of the tape stored in a cassette.

⑩⑪⑫ **Cassette classification sensors**
These sensors detect the three cassette type detection tabs of a cassette.
These sensors are used to discriminate whether a cassette can be used in this unit.

⑬ **L cassette (SP) REC inhibit sensor**
This sensor (switch) detects the condition of a REC inhibit plug for the Betacam/Betacam SP large cassette.

⑭ **L cassette (SX) REC inhibit sensor**
This sensor (switch) detects the condition of a REC inhibit plug for the Betacam SX large cassette.

⑮ **T reel table FG sensor**
This sensor detects the rotation speed of the take-up reel motor. The output signal of this sensor enters the reel motor servo circuit, and controls the reel table rotation speed.

⑯ **Reel S position sensor**
⑰ **Reel L position sensor**
These sensors detect whether the reel table moves to the correct position according to the size of the inserted cassette.

⑱ **S reel table FG sensor**
This sensor detects the rotation speed of the supply reel motor. The output signal of this sensor enters the reel motor servo circuit, and controls the reel table rotation speed.

⑲ **S cassette REC inhibit sensor**
This sensor (switch) detects the condition of a REC inhibit plug for the small cassette.

⑳ **S tension regulator arm sensor**
This sensor detects the position of an S tension regulator arm. During recording and playback, the output signal of this sensor enters the S reel motor servo circuit, and controls the reel torque to keep a constant S tape tension.

㉑ **Tape end sensor**
This sensor detects the end of the tape that runs in the forward direction.

㉒ **Cassette-in sensor (L)**
This sensor detects whether a cassette is being inserted.

㉓ **Cassette size sensor**
This sensor detects whether the inserted cassette is L size or S size.

㉔ **Cassette-in sensor (R)**
This sensor detects whether a cassette is being inserted.

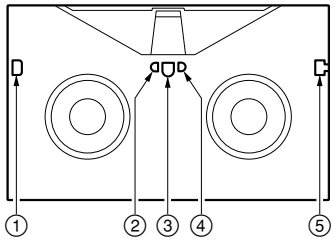
㉕ **Cassette-down (2) sensor**
㉖ **Cassette-down (1) sensor**
These sensors detect the movement (position) of a cassette compartment by the combination of the detection state of the two sensors and a cassette-in sensor.

1-10. System of Cassettes

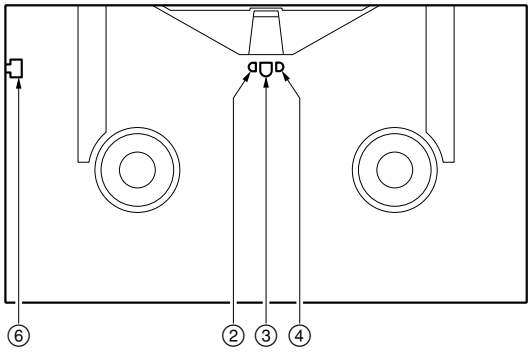
As shown in the figure below, plugs and tabs are provided at the back side of the cassette tape.

Cassette for Betacam or Betacam SP

Small cassette (S cassette)



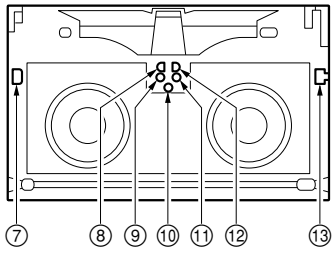
Large cassette (L cassette)



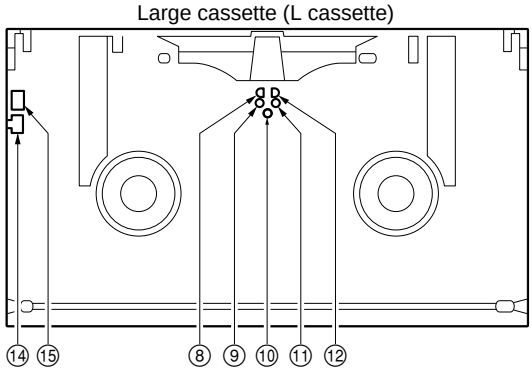
① S cassette REC inhibit tab (for oxide tape)
② Tape thickness detection tab
③ Metal tape detection tab
④ Reel hub diameter detection tab
⑤ S cassette REC inhibit plug (for metal particle tape)
⑥ L cassette REC inhibit plug

Cassette for Betacam SX

Small cassette (S cassette)

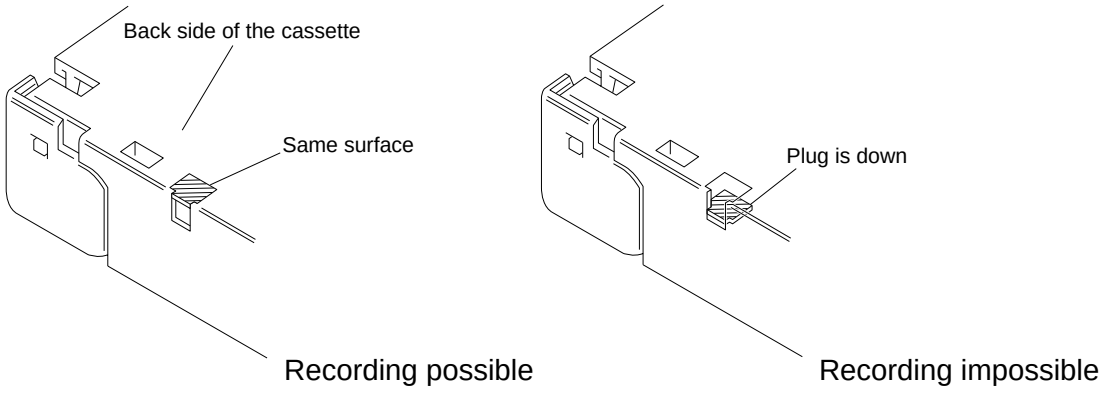


Large cassette (L cassette)



⑦ S cassette analog REC inhibit hole
⑧ Tape thickness detection tab
⑨⑩⑪ Cassette classification detection tabs
⑫ Reel hub diameter detection tab
⑬ S cassette digital REC inhibit tab
⑭ L cassette digital REC inhibit tab
⑮ L cassette analog REC inhibit hole

REC Inhibit Plugs



Detection Tabs

In cassette for Betacam or Betacam SP

No.	Usage	With Tab (Close hole)	Without Tab (Open hole)
②	Tape thickness detection	Thick (Tape thickness is 20 µm)	Thin (Tape thickness is 15 µm)
③	Metal tape detection	Oxide tape	* Metal particle tape
④	Reel hub diameter detection	Small hub	Large hub

* : For the metal particle tape, digital recording can be performed using a Betacam SX format.

In cassette for Betacam SX

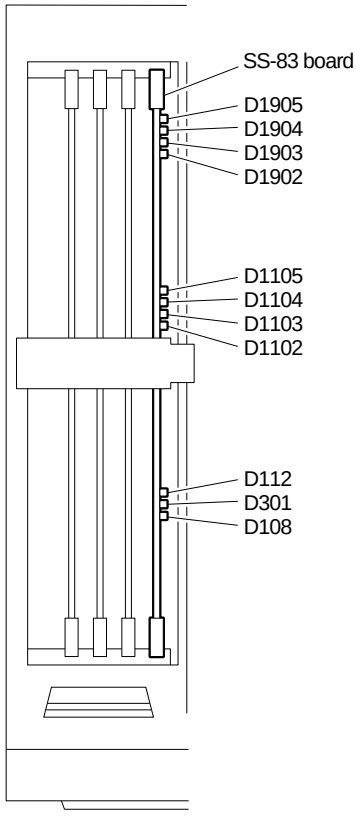
No.	Usage	With Tab (Close hole)	Without Tab (Open hole)
⑧	Tape thickness detection	Tape thickness is 14.5 µm	Tape thickness is other than 14.5 µm
⑫	Reel hub diameter detection	Small hub	Large hub
⑨⑩⑪	Cassette classification detection	Without tab (open hole) at only ⑨ for Betacam SX cassette. Represents the cassette classification by combination of three tabs. (See below)	

Cassette classification detection tabs

○ : with tab (close hole), ● : without tab (open hole)

State of Tabs ⑨ ⑪ ⑩	Cassette Class	Remark
○○	Betacam or Betacam SP	Oxide tape is unusable
●○	Betacam SX	———
○●	Digital Betacam	Unusable
●○, ○●, ●●, ○●, ●●	Except the above class	Unusable

1-11. Function of LEDs on Circuit Boards



SS-83 board

LED No.	Name	Color	Description	Normal state
D108	SV	Amber	Represents the result of communication test of ROM and RAM in power-on by blinking pattern. (Refer to followings.)	Blinks
D112	TRVR	Amber	Lights when the tracking VR is enable.	Off
D301	DRUM	Amber	Blinks when the drum microcomputer (IC314) operates normally. Usually lights for 30 ms at intervals of 1.1 to 1.5 s. The blinking interval is inverted when the drum is locked.	Blinks
D1102	SY1 STS1	Green	Blinks when SYS1 CPU operates normally.	Blinks
D1103	SY1 STS2	Green	Lights in good communications between SYS1 CPU and KY MPU (KY-438 board). Turns off in bad communications between SYS1 CPU and KY MPU (KY-438 board).	On
D1104	MAINTE	Green	Lights during executing maintenance mode.	Off
D1105	SY1 ERR	Red	Lights when SYS1 CPU does not operate normally. Blinks in bad communications between SYS1 CPU and other CPU/MPU (SYS2, KY, etc.).	Off
D1902	SY2 STS1	Green	Blinks when SYS2 CPU operates normally.	Blinks
D1903	SY2 STS2	Green	Lights in good communications between SYS2 and SV CPUs. Turns off in bad communications between SYS2 and SV CPUs.	On
D1904	SY2 STS3	Green	Lights in good communications between SYS2 and SYS1 CPUs. Turns off in bad communications between SYS2 and SYS1 CPUs.	On
D1905	SY2 ERR	Red	Lights when SYS2 CPU does not operate normally. Blinks in bad communications between SYS2 CPU and other CPU (SYS1, SV, etc.).	Off

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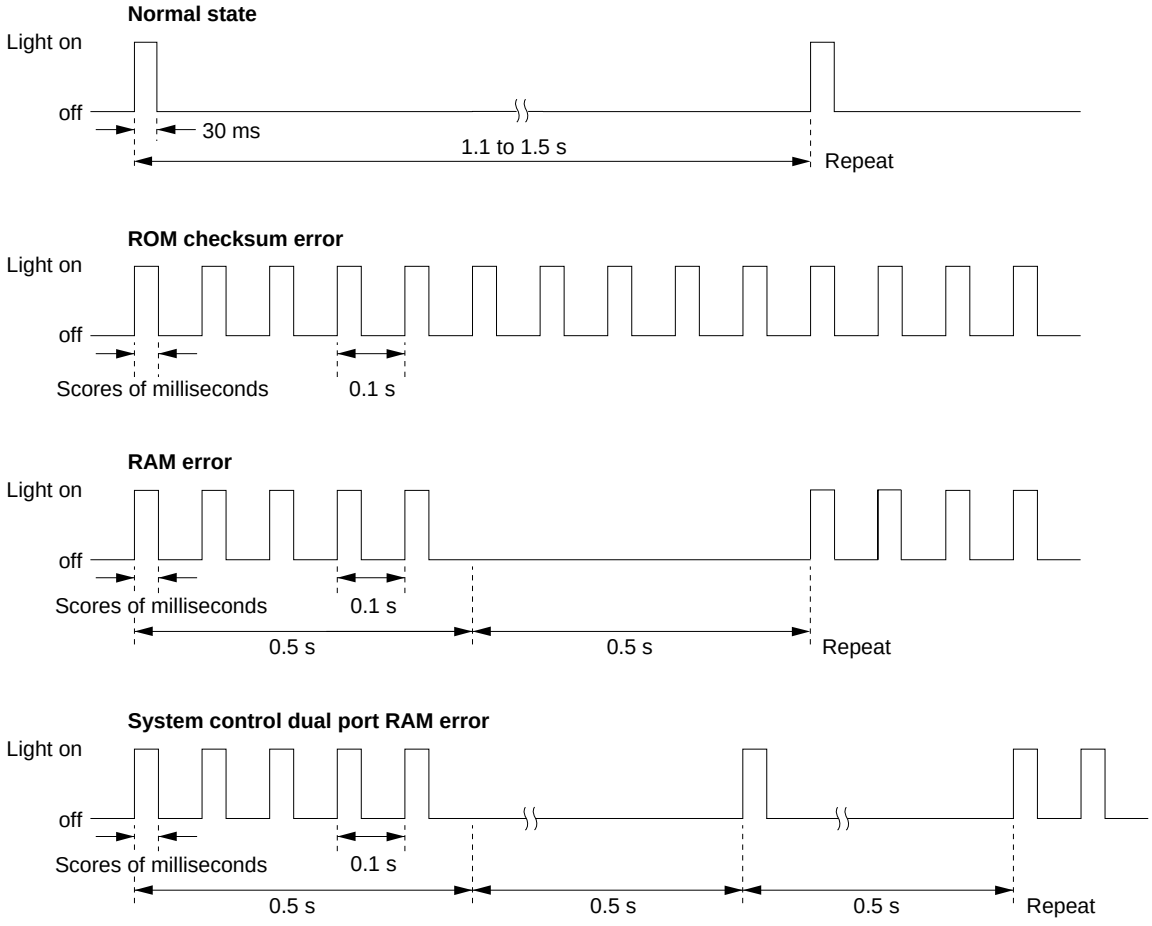
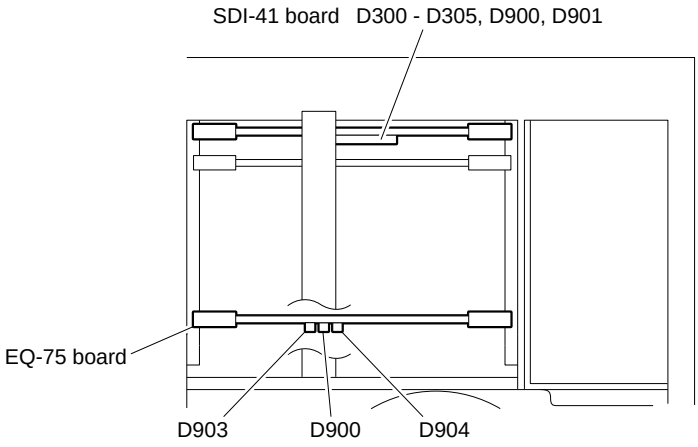
Blinking patterns of D108 on SS-83 board





EQ-75 board

LED No.	Name	Color	Description	Normal state
D900	—	Amber	Blinks during the EQ microcomputer is under normal operation. Lights in the following cases: • NV-RAM checksum error (when writing/reading in power-on) • NV-RAM verify error (when saving NV-RAM) • INNER ECC status error • REC data parity error • Not satisfied requirements in auto-alignment (exclusive of failure and NG) • Not started communications with SYSCON	Blinks
D903	—	Red	Lights in REC mode.	On/Off
D904	—	Green	Not used	Off

SDI-41 board

LED No.	Name	Color	Description	Normal state
D300	SDI INPUT EXIST	Green	Lights when detected that the SDI format signal exists in the SDI INPUT connector.	On
D301	RX EDH VALIDITY	Green	Lights when the signal received by the SDI INPUT connector conforms to the EDH.	On
* D302	RX EDH OTHER ANC ERROR	Red	Lights when other ancillary data exists in the EDH block of the signal received by the SDI INPUT connector.	Off
* D303	RX EDH AP ERROR	Red	Lights when an active picture EDH error is detected from the signal received by the SDI INPUT connector.	Off
* D304	RX EDH FF ERROR	Red	Lights when a full-field EDH error is detected from the signal received by the SDI INPUT connector.	Off
* D305	RX EDH ANC ERROR	Red	Lights when an ancillary data EDH error is detected from the signal received by the SDI INPUT connector.	Off
D900	SDI TRS	Green	Lights when the SDI INPUT connector can receive the SDI format signal normally.	On
D901	VCO ADJ	Green	Lights when electronic volume (EVR) data comes near the proper value during VCO free-running adjustment in the maintenance mode.	Off

*: These LEDs operate when the received signal conforms to the EDH (Error Detection and Handling).

1-12. Taking Out the Cassette in Tape Slacking

Note

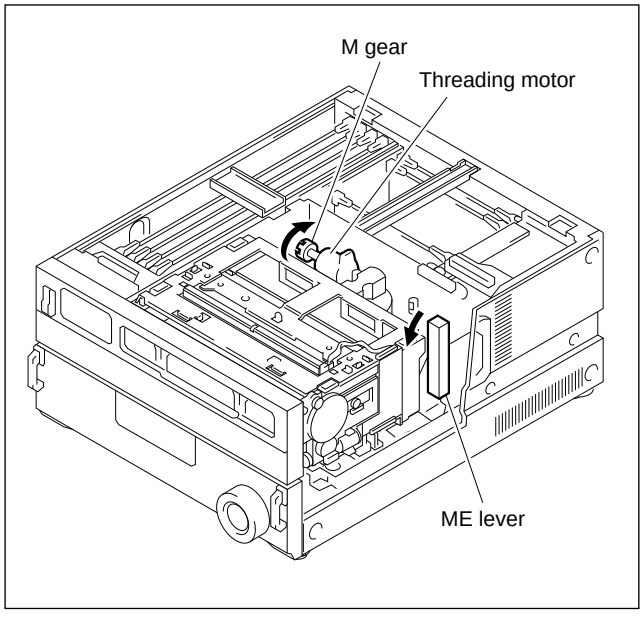
Turn off the power and unplug the power cord before starting the working.

When the tape is slacked in this unit, follow the steps below to take out the cassette tape.

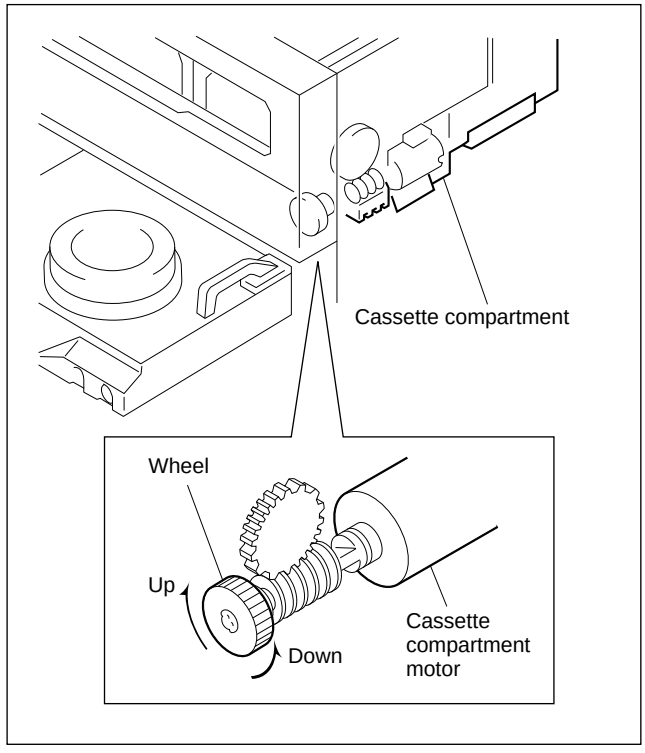
Note

Being careful not to damage the tape, take out the cassette tape with care.

1. Turn off the power.
2. Remove the upper lid.
   (Refer to “1-3-1. Upper Lid, Side Panels, and Bottom Plate Removal/Installation”.)
3. Remove the plate MD assembly.
   (Refer to “1-4. Plate MD Assembly Removal/Installation”.)
4. Rotate the M gear of the threading motor block in the direction of the arrow with the fingers by about a half turn to slack off the tape.
5. Pull the ME lever toward the front panel side to take up the tape inside the cassette.



6. To wind up the tape, repeat steps 4 and 5.
7. Pull the lower control panel slightly forward, then pull it more strongly to tilt the lower control panel upward (to 90˚ position).
8. Turn the wheel of the cassette compartment motor clockwise as shown in the figure until the cassette is ejected completely.

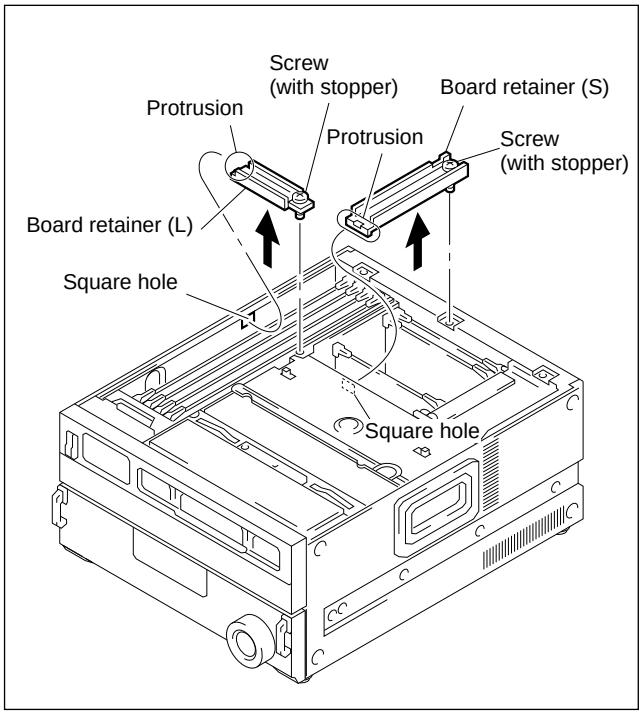


1-13. Pulling out/Insertion of Plug-in Board

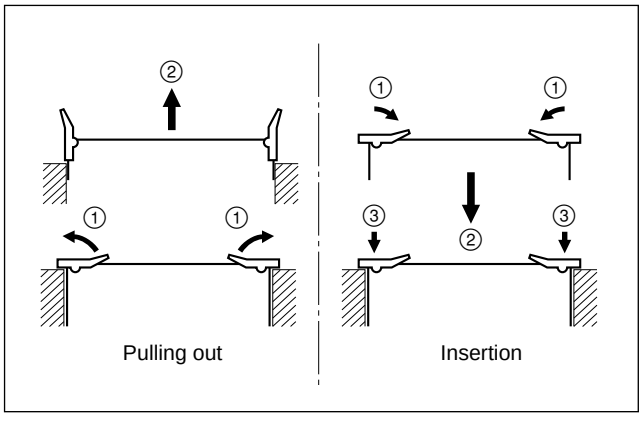
Note

Turn off the power and unplug the power cord before starting the removal/installation.

1. Remove the upper lid.
   (Refer to "1-3-1. Upper Lid, Side Panels, and Bottom Plate Removal/Installation".)
2. To remove the board retainer (L) or (S), loosen the screw of it.



3. Turn the eject levers on the board to the direction of the arrows. (Disconnect the board from the motherboard.)
4. Hold the eject levers and slowly pull the board out.



5. When removing the EQ-75 or SDI-41 board, disconnect the harnesses from its board.

EQ-75 board :	CN100 (B-7)	6P White
	CN500 (A-4)	4P White
	CN600 (G-3)	4P Red
	CN1500 (A-5)	4P Black
	CN1600 (G-5)	4P Yellow
SDI-41 board :	CN100 (A-1)	1P Red
	CN101 (B-1)	1P Yellow
	CN700 (F-1)	1P Orange
	CN701 (E-1)	1P Green
	CN800 (G-1)	1P Blue

For insertion, perform in the reverse procedures of pulling out.

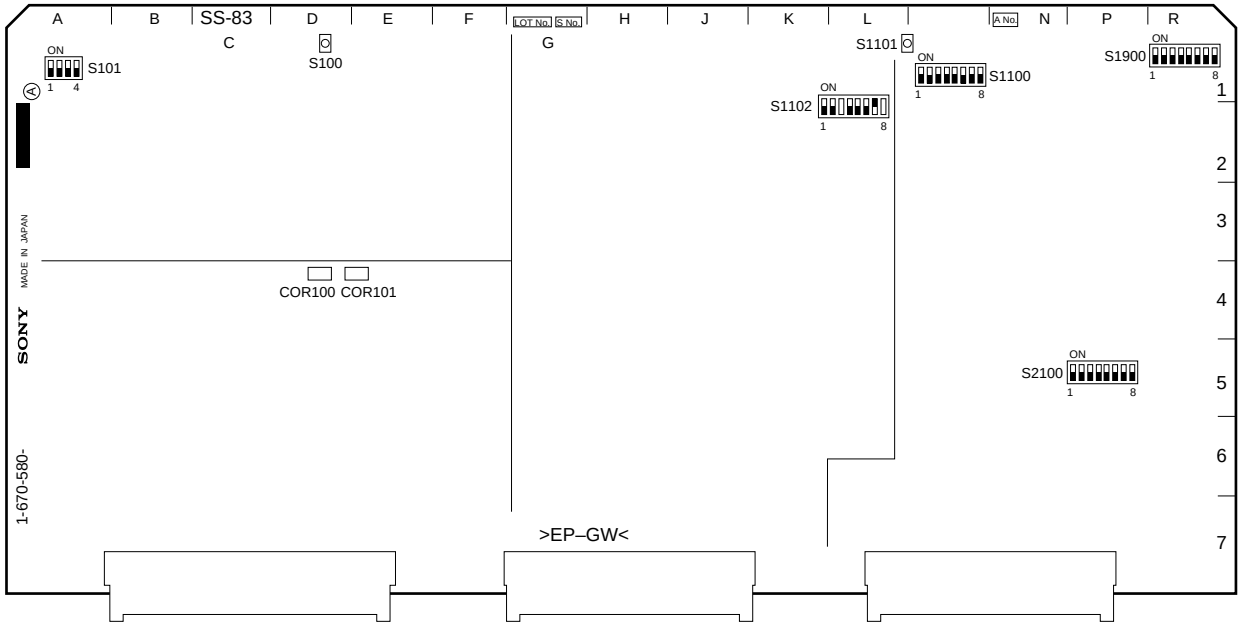
Notes

- After board insertion, push the two eject levers simultaneously to firmly connect the plug-in board to the connector on the motherboard (MB-818 board).
- To reattach the board retainer, tighten the screw after inserting the protrusion of the board retainer into the square hole of chassis.

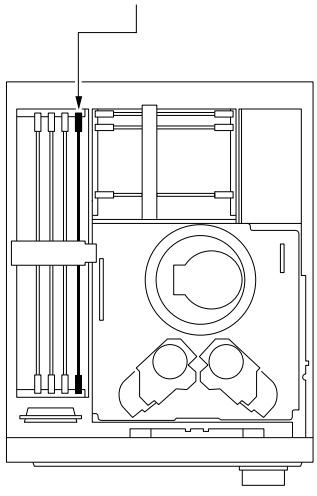
1-14. Switch and Shorting Plug on SS-83 Board

Note

Never change the settings of the factory use switches/shorting plugs.



SS-83 Board (Side A)



< Top View >

Note

Refer to “1-13. Pulling Out/ Insertion of Plug-in Board” for pulling out and insertion of board.

SS-83 board shorting plug

Ref. No.	Name	Description	Factory setting
COR 100	————	Factory use	OPEN
COR 101	————	Factory use	OPEN

SS-83 board switch

Switch No.		Name	Description	Factory setting
S100		REEL POSITION	Press this switch when changing the reel position. This switch does not operate in the state of installing the cassette compertment.	————
S101	1	FLASH MEMORY	**Note** Do not change the setting of this switch during installation. Select the operation mode of flash memory. OFF (OPEN) : Normal mode ON (CLOSE) : Writing mode	OFF (OPEN)
	2, 3	————	Factory use	
	4	SV ERR DISABLE	**Note** Do not change the setting of this switch during installation. This switch selects whether to disable the detection of a malfunctional error in a servo circuit. OFF (OPEN) : Enable (normal) ON (CLOSE) : Disable	OFF (OPEN)
S1100	1	EXTENDED MENU	OFF (OPEN) : Not display extended menu of set up menu ON (CLOSE) : Displays extended menu of set up menu	OFF (OPEN)
	2	MAINTE MODE ACCESS	OFF (OPEN) : Not enter into maintenance mode from lower control panel ON (CLOSE) : Enters into maintenance mode from lower control panel	OFF (OPEN)
	3	————	Factory use	OFF (OPEN)
	4	RS232C DEBUG	OFF (OPEN) : RS-232C connector is for ISR ON (CLOSE) : RS-232C connector is for debug	OFF (OPEN)
	5-8	————	Factory use	OFF (OPEN)
S1101		MAINTE MODE START	Press this switch when starting maintenance mode.	————
S1102		**Note** Never change the settings of the S1102 switch since each switch is set according to the characteristics of the unit. But set this switch according to each unit when replacing the board.		
	1, 2	————	Factory use	OFF (OPEN)
	3-6	Model ID	DNW-75/75P / TTV 4074P 3: OFF / ON 4: OFF / OFF 5: OFF / OFF 6: ON / ON	⇦
	7	J/UC	Settable when pin No.8 is OFF. OFF (OPEN) : Japan model ON (CLOSE) : Except Japan model	ON (CLOSE)
	8	525/625	OFF (OPEN) : 525/60 model ON (CLOSE) : 625/50 model	DNW-75: OFF (OPEN) DNW-75P/TTV 4074P: ON (CLOSE)
S1900	1-8	————	Factory use	OFF (OPEN)
S2100	1-8	————	Factory use	OFF (OPEN)

1-15. Circuit Protection Device (Fuse)

Fuses for circuit protection are mounted on the boards of the VTR.
A fuse will below when abnormality occurs and an over-current flows (or over-heat occurs) in the equipment. Be sure to replace it with the specified fuse as shown below after tracing and removing the root of the fuse-blowing.

CAUTION

Use the specified part only

The fuse is critical parts to safe operation. Replace these components with Sony parts whose part numbers appear in this manual published by Sony. If not, this may cause a fire or electric shock. Be sure to use the specified component in this manual.

Board name	Ref. No. (address)	Description	Part No.
APR-40 board	PS1200 (F-7)	Fuse (chip) 0.5 A, 125 V	⚠1-533-271-21
DEC-110 board	PS300 (F-7)	Fuse (chip) 2 A, 125 V	⚠1-533-351-11
DPR-118 board	PS11 (G-7) PS12 (G-7) PS13 (H-7) PS15 (E-7)	Fuse (chip) 4 A, 125 V	⚠1-533-272-11
DR-315 board	PS1 (A-5)	Fuse (chip) 5 A, 125 V	⚠1-533-275-21
EQ-75 board	PS1 (G-7)	Fuse (chip) 4 A, 125 V	⚠1-533-272-11
SDI-41 board	PS900 (F-7)	Fuse (chip) 4 A, 125 V	⚠1-533-272-11
SS-83 board	PS100 (E-7)	Fuse (chip) 3.15 A, 125 V	⚠1-533-266-11
	PS101 (E-7)	Fuse (chip) 0.5 A, 125 V	⚠1-533-271-21
TC-102 board	PS200 (D-1) PS300 (D-1)	Fuse (chip) 0.4 A, 125 V	⚠1-533-724-11
VPR-47 board	PS900 (E-7)	Fuse (chip) 5 A, 125 V	⚠1-533-275-21

Note: (address) means the mounted address of fuse.

1-16. Memory IC with Backup Battery

Memory IC (RAM, IC710) with backup battery is used on the SS-83 board.
This IC is used to store the setting data of setup menu, etc. Besides it has an RTC (Real Time Clock) function, which is also used in the VTR.
Owing to this battery, even if the external power is cut off, this IC can maintain the stored data and the RTC continues operating.
However, if the battery life comes to end with the external power was cut off, memory can not maintain the stored data and the RTC is failing to function.

In the memory, the following data is stored. When the battery is dead, or replaced with a new one, resetting current menu, menu banks 1 to 4, and calender/clock is required. For details on how to reset the current menu and menu banks, refer to the operation manual supplied with the unit.
When the battery is dead or replaced, error logs are all cleared.

- Current menu
- Menu banks 1 to 4
- Calender/Clock
- ID-code data

Backup battery

Refer to Section 1-17.

Replacement time

When life-ending the battery while the VTR is powered off, the RTC is failing to function.
If powered on in such a condition, the error code 96, sub error message “CALENDAR CLOCK” will be displayed. This message is displayed, be sure to replace the backup battery.

Note

- This sub error message is displayed on the video monitor connected to the VIDEO OUTPUT COMPOSITE 3 (SUPER) connector with the CHARACTER switch turned on.
  Other sub error messages, if present, are also displayed together.
- When the error code 96, sub error message “CALENDAR CLOCK” is displayed, the date in the calendar will be reset to 1/Nov. 1996.
  You can check the date in calendar/clock using the error logger display mode (M2 : ERROR LOGGER) in the maintenance mode.

1-17. Memory Backup Battery Replacement

The unit is equipped with a battery for the memory (IC710) backup on the SS-83 board. When replacing, be sure to use the specified part.

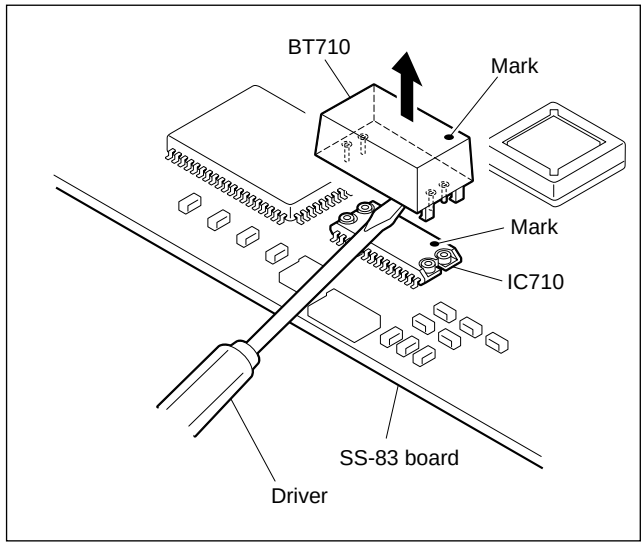
Replacement part: BT710/SS-83 board
Part description: M4T28-BR12SH1
(lithium battery)
Part No.: 1-767-156-11
Recommended replacement period: Every seven years

Replacement

Note

When replacing the battery, ensure that a mark on the battery is correctly oriented as shown in the following figure.

1. Remove the SS-83 board. (Refer to Section 1-13.)
2. Insert a flat blade driver between BT710 and IC710 to remove the battery.
3. Carefully install a new battery, ensuring that the mark’s on the BT710 and IC710 are aligned.
4. Reset the current menu and menu banks.
   (Refer to the operation manual.)
5. Reset the calender/clock.
   (Refer to Section “3-3-3. Setting Mode”.)
6. For the unit monitored with ISR application:
   Set the ID-code data on ISR apllication.
   (Refer to ISR protocol manual.)



1-18. NV-RAM

There are the NV-RAMs (EEP-ROM, and RAM with backup battery) and EVR ICs used on the boards in the VTR. These devices store the adjustment data, various setting data for the VTR, data for the hours meters and error log respectively, etc.

EEP-ROM: Electric Erasable P-ROM
EVR: Electric Variable Resister (D/A converter with EEP-ROM)

After replacing above-mentioned device, take the following service actions.
"Service action after replacing" and "Stored data" are listed on next page.
IC710 on the SS-83 board is the only NV-RAM with backup battery.

Note

After replacing the NV-RAM, the error (error code 95, 96, 97, or 98) will occur at power-on.

After replacing IC1/RM-179: Occurs Error code 95.
After replacing IC710/SS-83: Occurs Error code 96.
After replacing IC9/MS-58: Occurs Error code 97.
After replacing IC900/EQ-75: Occurs Error code 98.

When replacing IC710 on the SS-83 board and IC1 on the RM-179 board, the error will not occur at the second power-on and later.

Board / Ref.No.	Type	Stored data	Service action after replacing
DEC-110 / IC112	EVR IC	Adjustment data for DEC-110 board	Readjust the DEC-110 board (Video input system). (Perform Section 4-8.)
EQ-75 / IC900	NV-RAM	Adjustment data for EQ-75 board	Readjust the EQ-75 board (RF system). (Perform Section 4-5.)
MS-58 / IC9	NV-RAM	Adjustment data for servo system	After the initialization, readjust the servo system. (Refer to Section 4-4.)
		Hours meter data	None (All data are lost and automatically initialized to count zero.)
		Serial No.	Set by the menu M31 of the maintenance mode.
		Head room of the audio level meter	Set by the menu M37 of the maintenance mode. (When setting it to except 20 dB.)
		Setting data of ISR	Reset by the menu M39 of the maintenance mode.
RM-179 / IC2	NV-RAM	Setting data of 50-pin remote	Reset by the menu M32 of the maintenance mode.
SDI-41 / IC457	EVR IC	Adjustment data for SDI-41 board	Readjust the SDI-41 board (SDI input/output system). (Perform Section 4-9.) When the optional board is installed, also readjust the SDTI input/ output system. (Perform Section 4-9.)
SS-83 / IC710	NV-RAM	Setting data of setup menu	Set the setup menu again. (Refer to the operation manual.)
		Error logs data	None (All data are lost.)
		ID code data	Set by the ISR (Interactive Status Reporting) application software.
		Calendar/clock	Set the calendar and clock again. (Refer to Section "3-3. Error Logger display mode".)
VPR-47 / IC909	EVR IC	Adjustment data for VPR-47 board	Readjust the VPR-47 board (Video system). (Perform Section 4-8.)

Note

Refer to Section 3 for the menu of the maintenance mode.

1-19. Fixtures and Adjustment Equipment List

1-19-1. Fixtures

Fig. No.	Part No.	Description	[Inscription No.]	For use
①	J-6035-070-A	Extraction tool (for PLCC socket)	—	Extraction of IC (PLCC type)
②	J-6080-029-A	Small dental mirror (round type ø12)	—	Cassette pillar height adjustment, tape path adjustment
③	J-6086-570-A	Reference flat plate	[SL-657]	AT head zenith adjustment
④	J-6152-450-A	Wire clearance check gauge set	—	Clearance check
⑤	J-6251-090-A	Torque screwdriver's hexagonal bit (d=2.5 mm, l=120 mm)	—	Tightening screws to fix a drum assembly and upper drum asssembly
	J-6323-440-A	Torque screwdriver's hexagonal bit (d=0.89 mm, l=50 mm)	—	Tightening screws to fix a M gear
⑥	J-6323-420-A	Torque screwdriver's bit (+2 mm, l=75 mm)	—	Tightening screws to fix a brush/slip ring assembly
	J-6323-430-A	Torque screwdriver's bit (+3 mm, l=90 mm)	—	Tightening screws to fix a reel motor assembly or a ring roller
⑦	J-6252-510-A	Torque screwdriver (6 kg•cm)(0.6 N•m)	[JB-5251]	Tightening screws
	J-6252-520-A	Torque screwdriver (12 kg•cm)(1.2 N•m)	[JB-5252]	Tightening screws
⑧	A-8277-211-A	Extension board (L), EX-555	—	Extension of the large-sized plug-in board
⑨	A-8277-212-A	Extension board (S), EX-556	—	Extension of the small-sized plug-in board
⑩	J-6320-870-A	Reel motor shaft slantness check fixture	[MW-087]	Reel motor shaft slantness adjustment
⑪	J-6320-880-A	Cassette reference plate (L)	[MW-088]	Reel table height adjustment, Reel motor shaft slantness adjustment
⑫	J-6322-610-A	Tape guide adjustment driver	[MW-261]	Tape path alignment
⑬	J-6329-350-A	Reel table height gauge	[MW-935]	Reel table height adjustment
⑭	A-8321-333-A	Power cable assembly	—	Extension of the power supply unit
⑮	3-184-527-01	Cleaning cloth (15 cm × 15 cm)	—	Cleaning
⑯	7-432-114-11	Locking compound (200 g)	—	Inhibits loosening of screws
⑰	7-661-018-18	Diamond oil NT-68 (50 ml)	—	
⑱	7-651-000-10	Sony grease SGL-601 (50 g)	—	
⑲	7-700-736-01	L-shaped hexagonal wrench (d=1.27 mm)	—	
	7-700-736-04	L-shaped hexagonal wrench (d=2.5 mm)	—	
	7-700-736-05	L-shaped hexagonal wrench (d=1.5 mm)	—	
	7-700-736-06	L-shaped hexagonal wrench (d=0.89 mm)	—	
⑳	7-700-766-04	Hexagonal wrench driver (d=2.5 mm)	—	
㉑	8-960-075-01	Alignment tape, SR5-1	—	Video/audio alignments (for 525/60 system)
	8-960-075-11	Alignment tape, SR2-1	—	Servo alignments (for 525/60 system)
	8-960-075-51	Alignment tape, SR5-1P	—	Video/audio alignments (for 625/50 system)
	8-960-075-61	Alignment tape, SR2-1P	—	Servo alignments (for 625/50 system)
㉒	9-911-053-00	Thickness gauge	—	Clearance check
㉓	9-919-573-01	Cleaning liquid	—	Cleaning
㉔	J-6530-650-A	Head tip protrusion measurement gauge	—	Head tip protrusion check of the video heads
㉕	J-6190-800-A	Tension regulator slantness check tool	[BW-080]	Slant guide slantness adjustment
㉖	A-8319-485-A	IC memory card box, CDS-20 assembly	—	Software update
㉗	1-772-003-11	IC memory card (2 MB), MB98A81183	—	Software update
	1-772-004-11	IC memory card (4 MB), MB98A81273	—	Software update

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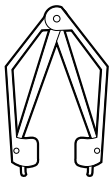
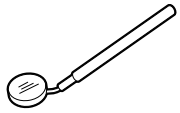
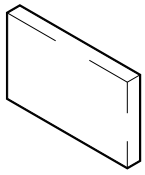
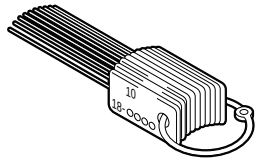
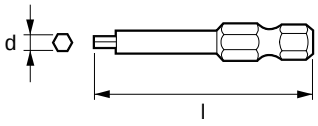
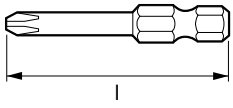
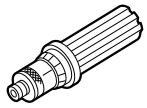
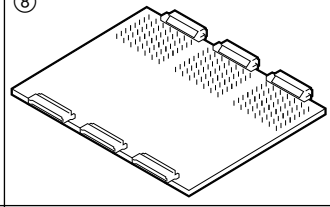
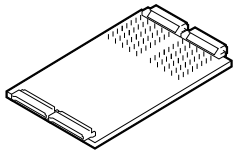
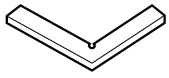
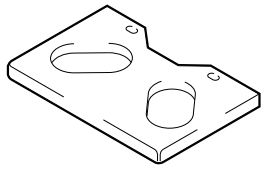
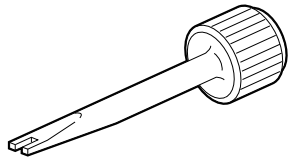
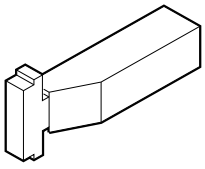
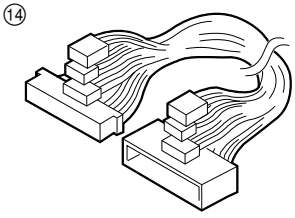
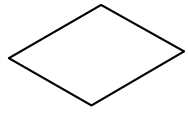
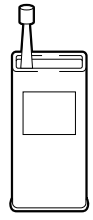
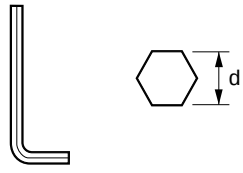
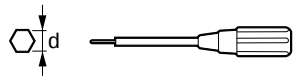
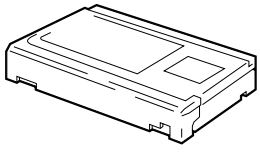
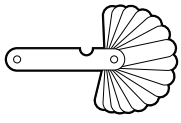
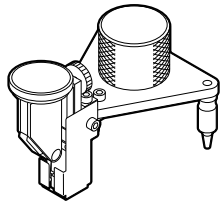
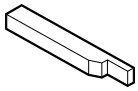
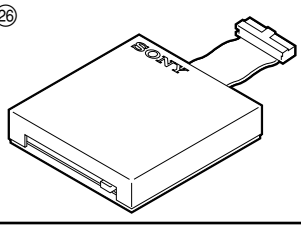
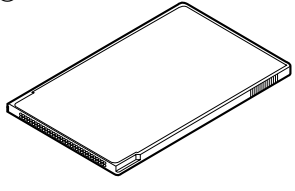
① 	② 	③ 	④ 
⑤ 	⑥ 	⑦ 	⑧ 
⑨ 	⑩ 	⑪ 	⑫ 
⑬ 	⑭ 	⑮ 	⑯ 
⑰	⑱	⑲ 	⑳ 
㉑ 	㉒ 	㉓	㉔ 
㉕ 	㉖ 	㉗ 	

1-19-2. Equipment for Adjustment

It is recommended to use the equipment listed below or the equivalents.
Each equipment is available as a standard product.

Equipment	Model name	Remarks
Analog composite video signal generator (with GENLOCK mode)	Tektronix 1410	(For 525/60 system)
	Tektronix 1411	(For 625/50 system)
Analog composite video signal generator	Tektronix TSG-170A	(For 525/60 system)
	Tektronix TSG-271	(For 625/50 system)
Analog component video signal generator	Tektronix TSG-300	For generating SMPTE/EBU format analog video signal (For DNW-75)
	Tektronix TSG-371	For generating SMPTE/EBU format analog video signal (For DNW-75P)
Digital component video signal generator	Tektronix TSG-422 (OP.1S)	For generating 4:2:2 format digital signal
Oscilloscope	Tektronix 2465B	
Analog component waveform monitor	Tektronix WFM300 or WFM300A	For measuring analog component video levels
Serial component waveform monitor	Tektronix WFM601	
Analog composite waveform/vector monitor	Tektronix 1750 or 1780R	For measuring analog composite SC-H (For 525/60 system)
	Tektronix 1751 or 1781R	For measuring analog composite SC-H (For 625/50 system)
Audio signal generator	Tektronix SG505 (OP.02)	
Audio analyzer	Tektronix AA501A (OP.02)	For measuring levels (dBm), distortion, and dB ratio
Audio level meter	Hewlett-Packard HP3400A	
Frequency counter	Advantest TR5821AK	
Digital voltmeter	Advantest TR6845	
Monitor with serial digital input	Sony BVM-1311 (with optional accessory BKM-2085-14)	(For DNW-75)
	Sony BVM-1411 (with optional accessory BKM-2085-14)	(For DNW-75P)
Time code generator	Sony BVG-1600	(For 525/60 system)
	Sony BVG-1600PS	(For 625/50 system)
Time code reader	Sony BVG-1500	(For 525/60 system)
	Sony BVG-1500PS	(For 625/50 system)
Terminator	—	75-ohm, BNC type
BNC T adapter	—	75-ohm
Recording tape	Sony BCT-SX series	Cassette tape for Betacam SX

1-20. Alignment Tape

Describes the alignment tapes used for adjusting the unit.

1. SR5-1 (SONY part No. 8-960-075-01): For 525/60 system
SR5-1P (SONY part No. 8-960-075-51): For 625/50 system

Used for video/audio adjustment.

Time (min. : sec.)	Digital video	Digital audio	CTL track
0:00 -	100 % color-bar	1 kHz sine wave, –20 dB FS	CTL
2:00 -	100 % color-bar	1 kHz sine wave, 0 dB FS	CTL
4:00 -	100 % color-bar	–∞ dB FS	CTL
6:00 -	100 % color-bar	20 Hz sine wave, –20 dB FS	CTL
8:00 -	100 % color-bar	20 kHz sine wave, –20 dB FS	CTL
10:00 -	Ramp	1 kHz sine wave, –20 dB FS	CTL
12:00 -	Ramp	1 kHz sine wave, 0 dB FS	CTL
14:00 -	Ramp	–∞ dB FS	CTL
16:00 -	Ramp	20 Hz sine wave, –20 dB FS	CTL
18:00 -	Ramp	20 kHz sine wave, –20 dB FS	CTL
20:00 -	100 % color-bar	1 kHz sine wave, –20 dB FS	CTL
22:00 -	100 % color-bar	1 kHz sine wave, 0 dB FS	CTL
24:00 -	100 % color-bar	–∞ dB FS	CTL
26:00 -	100 % color-bar	20 Hz sine wave, –20 dB FS	CTL
28:00 - 30:00	100 % color-bar	20 kHz sine wave, –20 dB FS	CTL

2. SR2-1 (SONY part No. 8-960-075-11) :For 525/60 system
SR2-1P (SONY part No. 8-960-075-61) :For 625/50 system

Used for servo adjustment.

Time (min. : sec.)	Digital video	Digital audio	CTL track
00:00-	3.212 MHz (A CH only)	SR2-1: 3 kHz, 0 VU	CTL
(Pulse*)		SR2-1P: 3.15 kHz, 0 VU	
15:00 -	A CH : 3.212 MHz	SR2-1: 3 kHz, 0 VU	CTL
	B CH : 6.424 MHz	SR2-1P: 3.15 kHz, 0 VU	
20:00 -	12.848 MHz (All CH)	SR2-1: 3 kHz, 0 VU	CTL
		SR2-1P: 3.15 kHz, 0 VU	
25:00 - 27:00	100 % color-bar (All CH)	No signal	CTL

*: The time code data is not recorded on the time code track during pulse portion (00:00 to 15:00). This portion is recorded the duty 7:3 pulse on the CTL track. Therefore, when playing back this portion, time data which is interpolated by the time code signal is displayed.

1-21. Extension Board

Extension board to extend the plug-in board is available in two types.

For Large Plug-in Board

Description: Extension board (L), EX-555
SONY part No.: A-8277-211-A

For Small Plug-in Board

Description: Extension board (S), EX-556
SONY part No.: A-8277-212-A

1-22. PLCC IC Removal

It is recommended that the tool below is used to remove the PLCC-type IC inserted into an IC socket.

Tool required

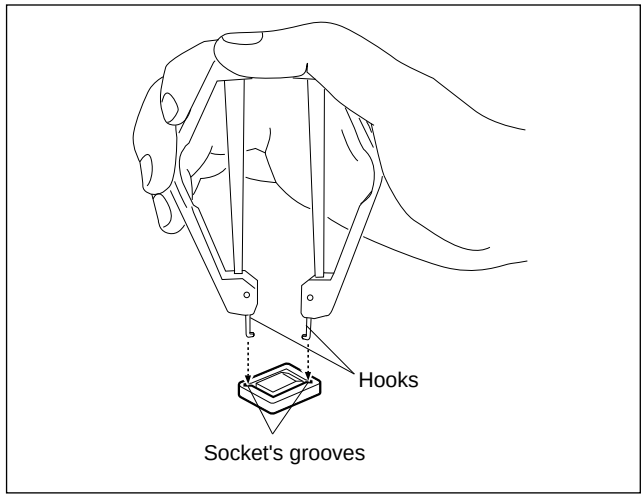
Description: IC extraction tool for PLCC socket
SONY Part No. J-6035-070-A
This tool can be used for IC whose pins number are 20 to 124.

Procedure

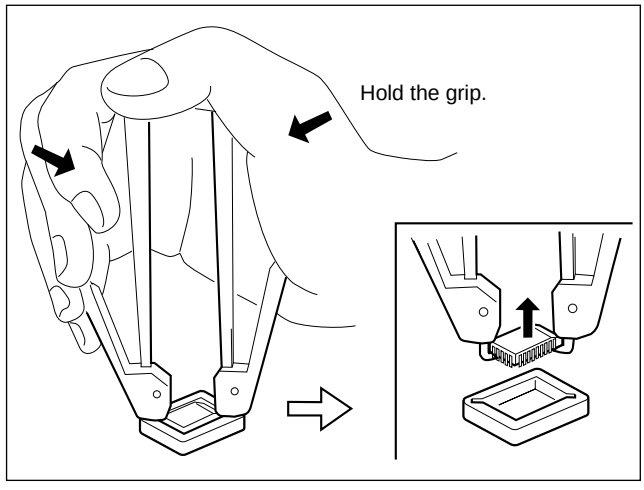
Notes

- Do not pull the IC upward using a hook of the extraction tool.
- Do not interpose the tool by excessive force.

1. Fit the tool's hooks in the grooves of IC socket.



2. Hold the grip as shown in the figure.
   Then holds IC with hooks, and removes it from the socket.
3. Lift up the tool softly with IC nipping.



1-23. Internal Video Test Signal

VTR has the internal video test signal generator.
There are two ways to generate the test signal with this generator.

- Setup extend menu
  ITEM-710 : INTERNAL VIDEO SIGNAL GENERATOR
  For detail, refer to “7-3. Extend Menu” of the operation manual.
- Maintenance mode
  C21 : VIDEO TEST SG
  For detail, refer to “3-2-4. AUDIO/VIDEO CHECK Mode (C2)”.

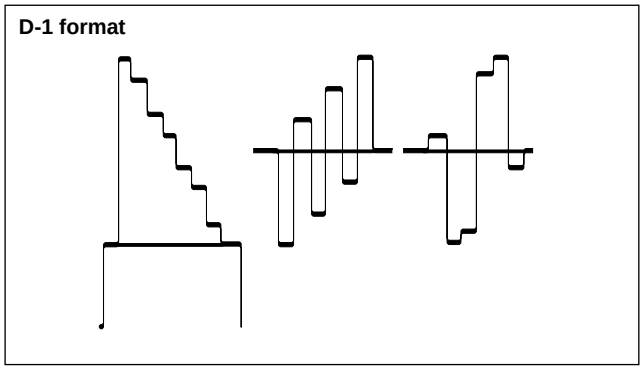
Describes output waveform figures of this generator below. These figures are drawn from waveforms that are watched COMPONENT OUT with the waveform monitor. They are measured with H rate and displayed with PARADE unless otherwise specified.

Note

In the 525/60 system, when selecting either D-1 format or Betacam format, set by the setup extend menu ITEM-709 : CAV LEVEL FORMAT, SUB-ITEM 1 : OUTPUT CAV LEVEL.
In the 625/50 system have no Betacam format.

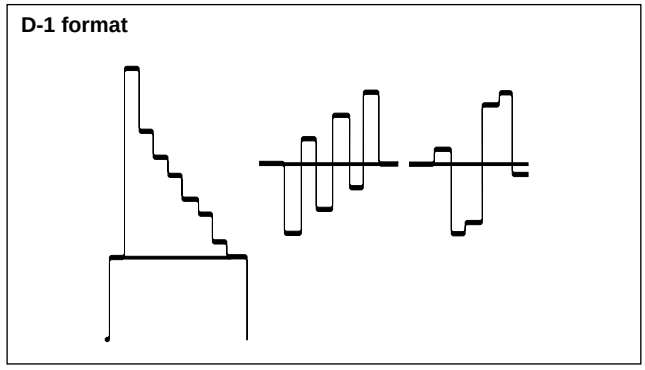
100% Color Bars

D-1 format

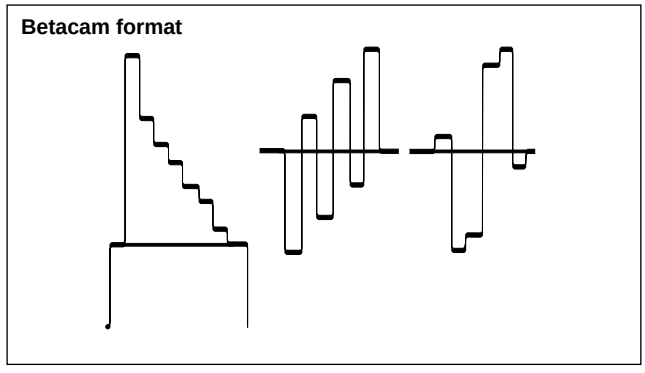


75% Color Bars

D-1 format

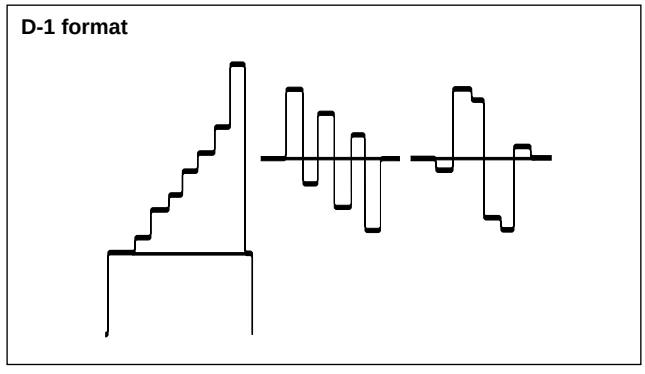


Betacam format

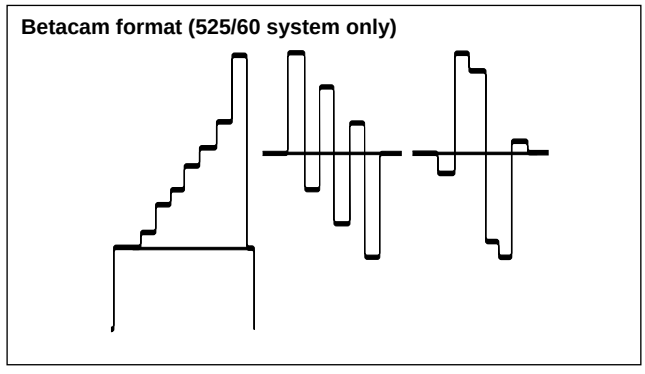


75% Reverse Color Bars

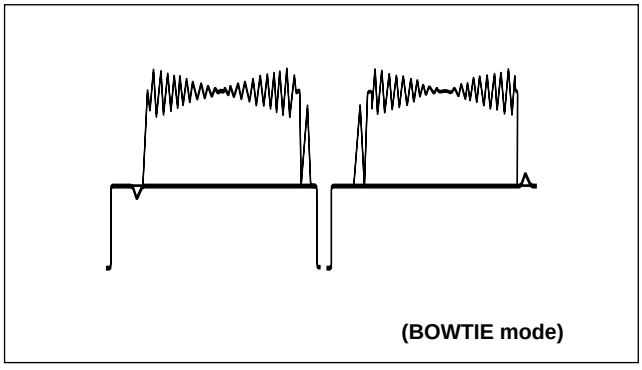
D-1 format



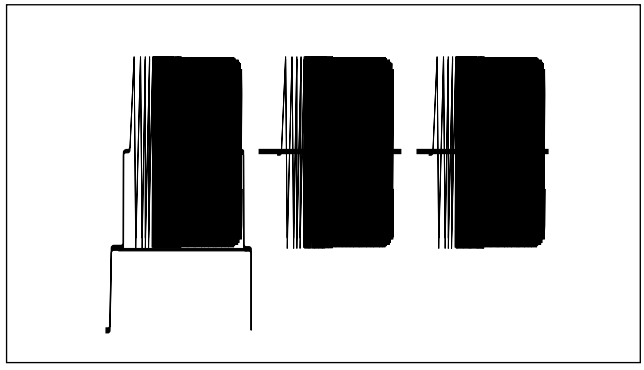
Betacam format (525/60 system only)



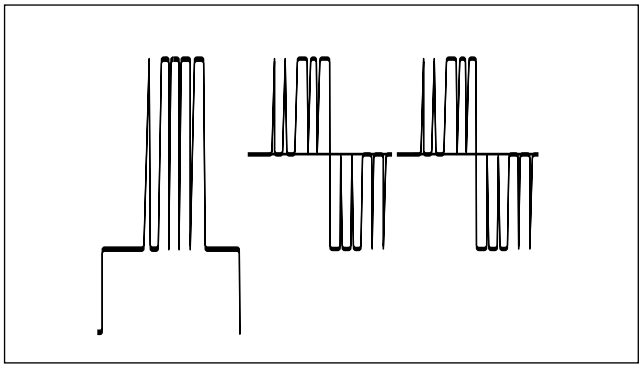
Bowtie



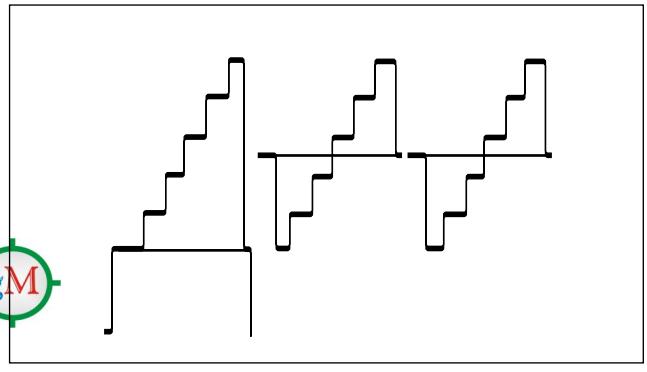
H Sweep



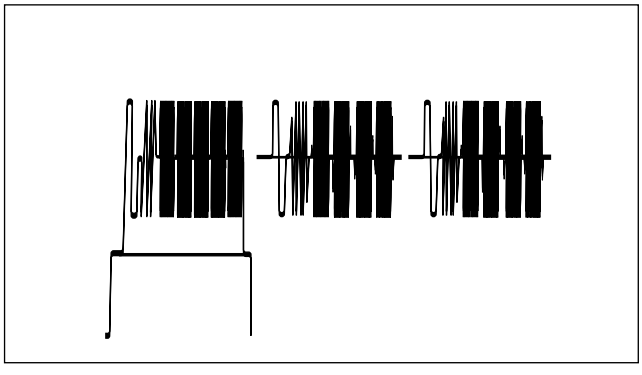
Pulse and Bar



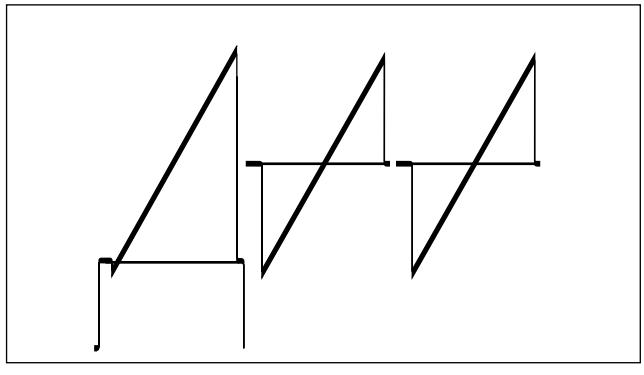
5 step



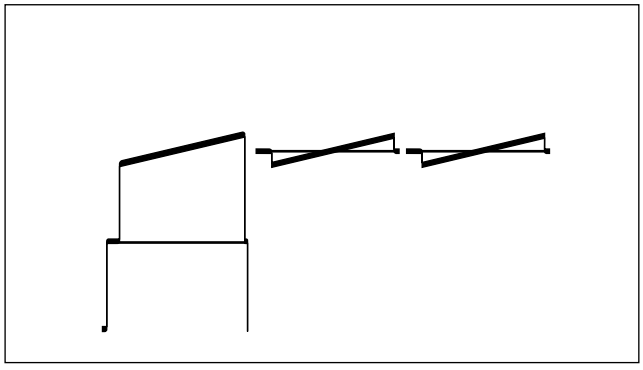
Multi Burst



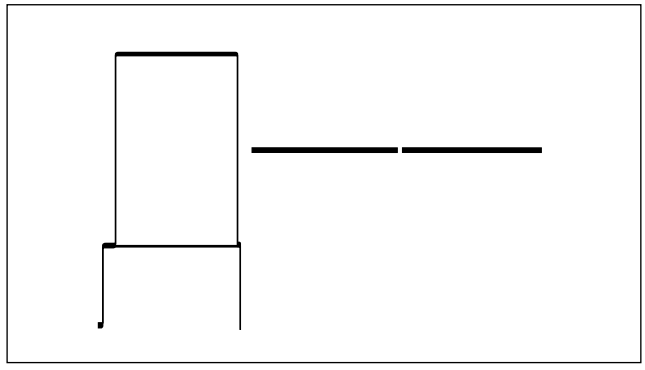
Ramp



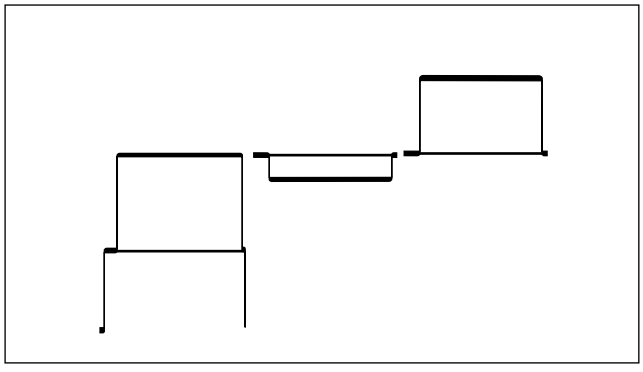
Shallow Ramp



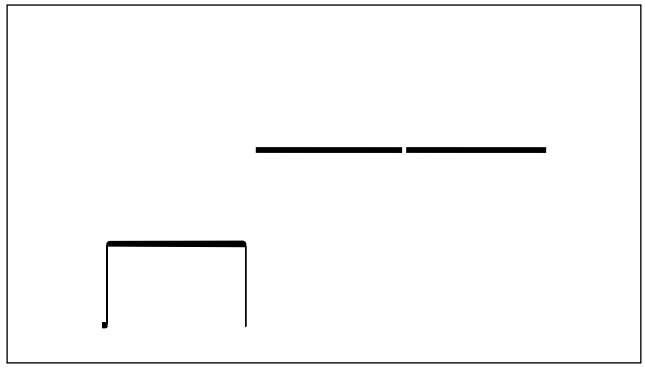
100% Flat



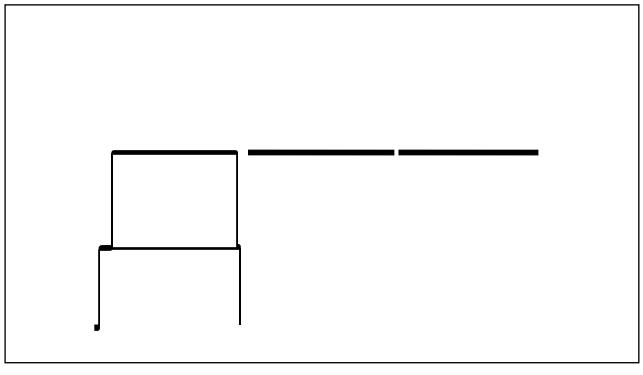
Red Signal



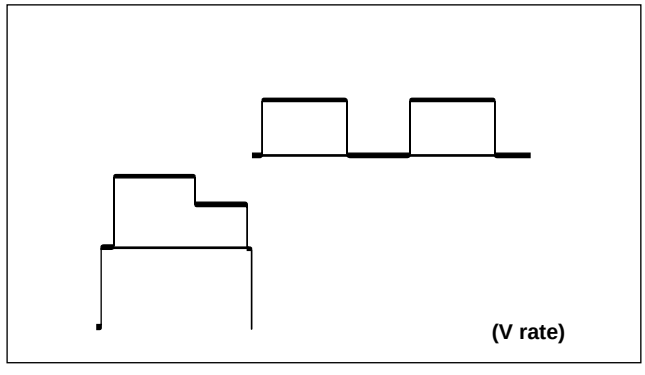
Black Burst



50% Flat

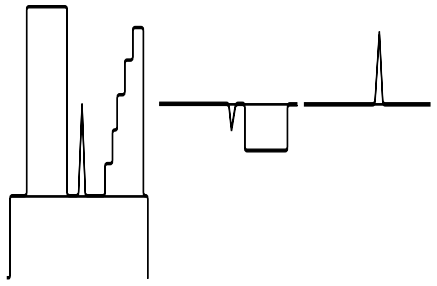


Pathological Check Code

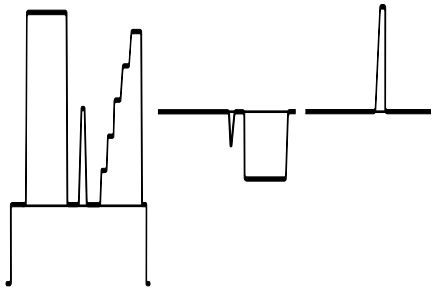


NTC7 (NTSC) (525/60 System only)

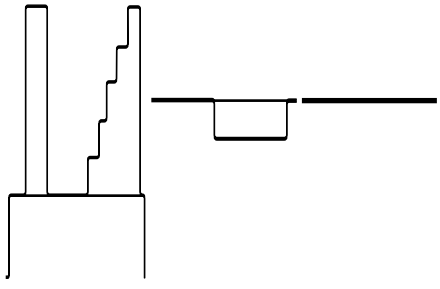
D-1 format



Betacam format



Line330 (625) (625/50 System only)



1-24. Setup Menu

This section explains the F-series items on the setup menu, which are for use during adjustment or maintenance.
For details on H-, 9- and B-series items, refer to the operation manual supplied with the unit.

1-24-1. Menu Operation

Preparation

The menus for F-series items are usually not accessible. To display them, internal switch setting for the SS-83 board is required. For details on the switch function, refer to Section 1-14.

• S1100-1/SS-83 board ⇨ ON

Note

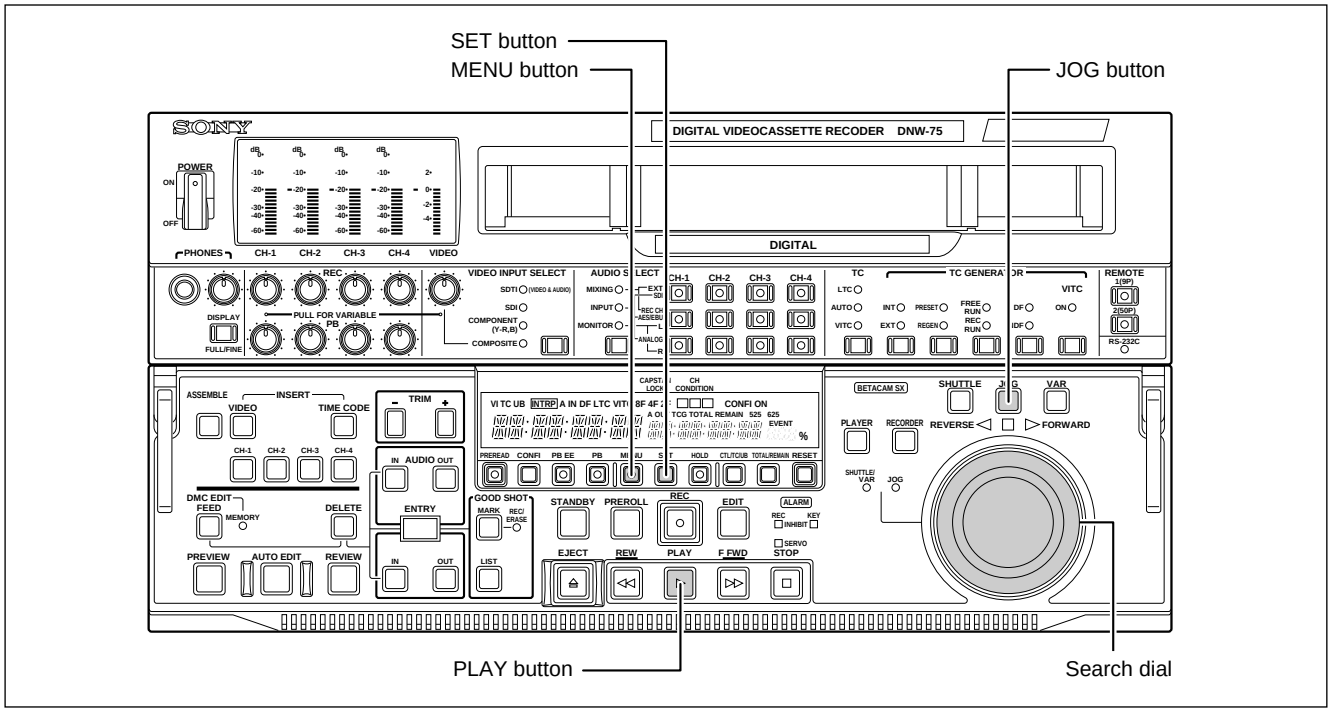
The menus for F-series items are exclusively for adjustment. After adjustment is completed, be sure to return them to their normal position.

Activating the menu

1. Press the MENU button.
2. Press the JOG button to enter the JOG mode.
3. Turn the seach dial while pressing the PLAY button.

Basic operation

- **To select ITEM**
  Turn the seach dial while pressing the PLAY button to display the desired ITEM in the time data display area.
- **To change DATA**
  Turn the seach dial while pressing the JOG button.
- **To enter the setting value**
  Press the SET button.



1-24-2. F-Series Items

No.	ITEM	DATA	Description
F02	EMERGENCY TAPE PROTECTION	[ENA] DIS	**Note** This item is used exclusively for servo and mechanical adjustment. After adjustment is completed, return to the factory setting “ENA”. Selects whether emergency tape protection operation is enabled or not when VTR detects error in tape transport mechanism. ENA: Tape protection operation is enabled DIS: Tape protection operation is disabled
F16	DEVICE TYPE MODIFY:0H	[0] 1 | FFFF	Determines response data to 9-pin remote command DEVICE TYPE REQUEST (00h, 11h). 0: Returns the original device type data of the unit Except 0: Returns the set values as they are: The higher-order two digits are for DATA-1 The lower-order two digits are for DATA-2 **Note** Any selection of the above does not influence the whole VTR operation including TTP. If this item is set to values other than the factory-setting (DATA:0), the operation of the unit is not ensured under the 9-pin remote command control.
F21	PROCESS CONT VR LOCAL ENABLE	[OFF] ON	Selects whether PROCESS CONTROL VR and sub control panel are enabled or not, when LOCAL DISABLE command is received through the 9-pin remote connector or the setup menu “006: LOCAL FUNCTION ENABLE” is set to “DIS” (all disable). OFF: Settings of PROCESS CONTROL VR and sub control panel switch are disabled ON: Settings of PROCESS CONTROL VR and sub control panel switch are enabled
F25	SERVO/AV REF SEL IN PREREAD MODE	[OFF] ON	Selects the reference servo signal during pre-read operation. OFF: The setting of ITEM-309 is enabled. ON: The reference servo signal is set to forced EXT. (An external reference video input signal is used in this case.)
F34	STOP PINCH OFF TIME	0 M [5 M] 10 M 15 M 20 M	Specifies the time at which the pinch ON condition is kept even if the PB operation is completed in the SX tape PB mode. The time is usually set to “5 M”. When “0 M” is set, the pinch is turned off as soon as the PB operation is completed. **Note** When the pinch is turned off, it takes a few seconds to output image and sound signals during PB operation of the next time.
F35	AUDIO DITHER	[ON] OFF	Specifies how to process the data when audio input data is recorded. ON: Processes the audio input data to be recorded by a dither method. The result is rounded and recorded in 16 bits. OFF: The audio input data of less than 17 bits is rounded down and recorded. **Note** Set “OFF” to record a signal accurately according to the input data.

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1-25. Service Action after Replacing or Repairing the Board

After replacing or repairing the mounted circuit board in this VTR, be sure to perform the following adjustment or the function check.
Moreover, when the SS-83 board is replaced, it is required to check the setting.

Note

When using the menu of the setup or maintenance mode, connect the analog composite video monitor to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

1-25-1. AC-169 Board

After replacing or repairing this board, turn the power on and check that the power is correctly applying to the VTR by the rotation of fan motor or condition of indicator.

1-25-2. APR-40 Board

After replacing or repairing this board, perform the audio system alignment (Section 4-6).

1-25-3. CCM-15 Board

For the threading motor

After replacing or repairing this board, check the functions of the threading motor using C012 : THREADING MOTOR in the maintenance mode.

(Refer to “3-2-2. SERVO CHECK Mode (C00-03)”.)

For the reel position motor

After replacing or repairing this board, check the functions of the reel shift motor using C016 : REEL POSITION MOTOR in the maintenance mode.

(Refer to “3-2-2. SERVO CHECK Mode (C00-03)”.)

Note

Since the mounted CCM-15 board is out of service part, prepare the plain CCM-15 board and the components of the CCM-15 board when replacing this board.
For the mounted component on this board, refer to Section 3 of the maintenance manual volume-2.

1-25-4. CL-29 Board

After replacing or repairing this board, check that the compartment block in the cassette compartment moves up and down normally using C013 : CASSETTE COMP MOTOR. of the maintenance mode.
(Refer to “3-2-2. SERVO CHECK Mode (C00-03)”.)

1-25-5. CP-278 Board

After repairing this board, perform the following checks.

Preparing tools

- Audio signal generator:
  TEKTRONIX SG505 option-02 or equivalent
- Audio analyzer:
  TEKTRONIX AA501A option-02 or equivalent

Checks

1. Set AUDIO SELECT to “INPUT” and select “ANALOG”.
2. Perform the following check for each channel.
   (1) Set the analog audio input level switch to “600 Ω”.
   (2) Input the audio signal of 1 kHz +4.0 dBm (600 Ω) to AUDIO INPUT connector from the signal generator.
   (3) Check that the audio level at AUDIO OUTPUT connector is 4.0 ±0.5 dBm by the audio analyzer.
   (4) Return the analog audio input level switch to the customer setting.

1-25-6. CP-301 Board

After repairing this board, perform the following checks.

Preparing tools

- Time code generator:
  525/60 system: SONY BVG-1600 or equivalent
  625/50 system: SONY BVG-1600PS or equivalent
- Time code reader
  525/60 system: SONY BVG-1500 or equivalent
  625/50 system: SONY BVG-1500PS or equivalent
- Audio analyzer:
  TEKTRONIX AA501A option-02 or equivalent

Checks

1. Connect the time code generator to TIME CODE IN connector, and the time code reader to TIME CODE OUT connector.
2. Set the upper control panel as follows:
   TC/AUTO/VISC: LTC
   INT/EXT: EXT
   PRESET/REGEN: PRESET
3. Check that the reader can read correctly the time code from the generator.
4. Return the above switches in the upper control panel to the customer settings.
5. To generate the test signal within VTR, select “1KHz SINE 0VU” using C23 : AUDIO TEST SG of the maintenance mode.
   (Refer to “3-2-4. AUDIO/VIDEO CHECK Mode (C2)”.)
6. Check that the audio level at MONITOR OUTPUT L connector is 4.0 ±0.5 dBm by the audio analyzer.
7. Check that the audio level at MONITOR OUTPUT R connector is 4.0 ±0.5 dBm by the audio analyzer.
8. Exit the maintenance mode.

1-25-7. CP-334 Board

After replacing or repairing this board, perform the following checks.

Preparing tools

- Analog composite video signal generator:
  TEKTRONIX TSG-170A or equivalent
- Analog component video signal generator:
  TEKTRONIX TSG-300 or equivalent
- Analog composite waveform monitor
  DNW-75: TEKTRONIX 1750, 1780R, or equivalent
  DNW-75P: TEKTRONIX 1751, 1781R, or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Analog component video monitor
  Used for displaying of the menu. Usually, connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- 75 Ω terminators (4 pieces)

Preparations

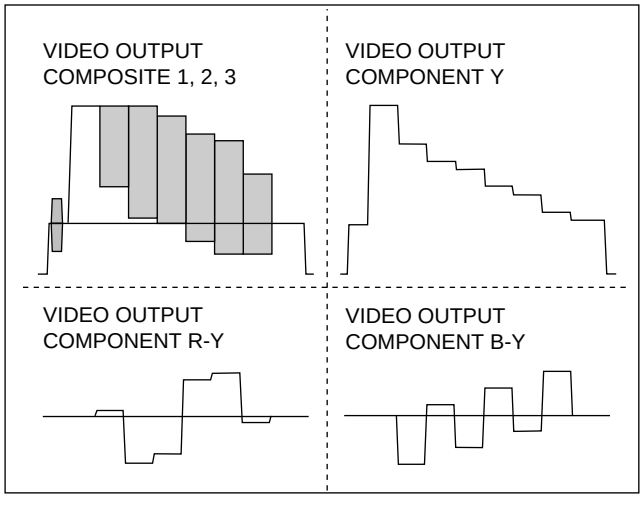
1. Set the following switches on the sub control panel.
   OUT REF switch: INPUT VIDEO
   CHARACTER switch: ON
2. Set the video system in the VTR using the setup menu ITEM-013 as follows:
   DNW-75: 525/60 system
   DNW-75P: 625/50 system
   (Refer to Section 7-2-2 of the operation manual.)
3. Press the PB.EE button on the lower control panel to light its indicator.
4. Set the setup extend menus as follows:
   ITEM-105 to “ON”
   ITEM-309 to “AUTO”
5. For the DNW-75 only, set the sub-ITEMs 0 and 1 in the setup extend menu ITEM-709 to “D-1”.
6. Input the analog composite video signal (BB signal) to REF VIDEO connector (75 Ω switch: ON).
7. Turn the CHARACTER switch to “OFF”.

Checks

1. Input the 75 % color-bar signal (composite) to VIDEO INPUT COMPOSITE connector (75 Ω switch: ON).
2. Set VIDEO INPUT SELECT to “COMPOSITE”.
3. Check that the STOP button is not blinking.
4. Check that abnormality does not exist in the output signal from COMPOSITE 1/2/3 of VIDEO OUTPUT connectors using the composite waveform monitor.
5. Input the 75 % color-bar signal (D-1 format, component) to VIDEO INPUT COMPONENT connectors (Y/R-Y/B-Y).
6. Set VIDEO INPUT SELECT to “COMPONENT”.
7. Check that the STOP button is not blinking.
8. Check that abnormality does not exist in the output signal from COMPONENT Y/R-Y/B-Y of the VIDEO OUTPUT connectors using the component waveform monitor.

Perfection

1. Set the CHARACTER switch to “ON”.
2. Return the setup extend menus ITEM-105/309/709 to the customer settings, and also return the OUT REF and CHARACTER switches to the customer settings.



Ex. 75 % Color-bar

1-25-8. CP-335 Board

After replacing or repairing this board, perform the following checks.

Preparing tool

- Equipment to input/output the AES/EBU signal:
  e.g. DNW-75, DNW-A75, DVW-A500

Checks

1. Set the AUDIO SELECT to “INPUT” and CH1/2/3/4 to AES/EBU.
2. Connect the equipment to output the AES/EBU signal to CH1/2 and CH3/4 of AUDIO INPUT (AES/EBU) connectors.
3. Input the generated the AES/EBU signal (1 kHz −20 dBFS) in the equipment to output the AES/EBU signal.
4. Check that the level meters of CH1 to CH4 indicate −20 dBFS.
5. Disconnect the connection of step 2.
6. Connect the equipment to input the AES/EBU signal to CH1/2 and CH3/4 of AUDIO OUTPUT (AES/EBU) connectors.
7. To generate the test signal, select “1KHz SINE 0VU” using C23 AUDIO TEST SG of the maintenance mode.
   Refer to “3-2-4. AUDIO/VIDEO CHECK Mode (C2)”.
8. Check that the level of CH1 to CH4 indicate −20 dBFS by the level meters of the equipment to input the AES/EBU signal.
9. Exit the maintenance mode.

1-25-9. DEC-110 Board

After replacing or repairing this board, perform the video input system adjustment (Section 4-8).

1-25-10. DPR-118 Board

After replacing or repairing this board, check that the VTR is able to correctly record the audio and video on the cassette tape and play back.

1-25-11. DR-315 Board

After replacing or repairing this board, perform the servo system electrical adjustments (Sections 4-4-3 and 4-4-5).

1-25-12. EQ-75 Board

After replacing or repairing this board, perform the RF system electrical adjustments (Section 4-5).

1-25-13. FP-117 Board

After replacing or repairing this board, perform the electrical adjustments (Section 4-10).

1-25-14. KY-438 Board

After replacing or repairing this board, check the functions of the switches, indicators, etc. on this board.

1-25-15. LP-81 Board

After replacing or repairing this board, perform the following checks.

1. Check the function of the cassette compartment when inserting the cassette tape.
2. Check that the all cassette compartment lamps (LEDs) are lighted with the cassette tape inserted.

1-25-16. MB-818 Board

After replacing or repairing this board, check the VTR's basic function is correct.

1-25-17. MS-58 Board

After replacing this board or its NV-RAM

1. Perform the servo system electrical adjustments (Section 4-4).
   Note
   Be sure to adjust after initializing the servo adjustment data in the NV-RAM on the MS-58 board.
   (Refer to Section 4-4-2.)
2. Set the serial number of the VTR using M31 : SERIAL NUMBER in the maintenance mode.
   (Refer to "3-4-3. SERIAL NUMBER Display Menu (M31)".)
3. Set the head room of the audio level meter using M37 : METER HEAD ROOM in the maintenance mode.
   (Refer to "3-4-7. METER HEAD ROOM Setup Menu (M37)".)

After repairing (except the NV-RAM replacement):
Usually perform the servo system alignment (Section 4-4).

1-25-18. PC-70 Board

After replacing or repairing this board, perform the following checks.

1. Check the function of the cassette compartment using C013 : CASSETTE COMP MOTOR. in the maintenance mode.
   (Refer to "3-2-2. SERVO CHECK Mode (C00-03)".)
2. Check the functions of the cassette size sensors and cassette-in sensors in the cassette compartment using C001 : CASSETTE COMP. SW in the maintenance mode.
   (Refer to "3-2-2. SERVO CHECK Mode (C00-03)".)

1-25-19. PD-35 Board

After replacing or repairing this board, check the function of the pinch solenoid using C020 : PINCH ROLLER of the maintenance mode.
(Refer to "3-2-2. SERVO CHECK Mode (C00-03)".)

Note

Since the mounted PD-35 board is out of service part, prepare the plain PD-35 board and the components of the PD-35 board when replacing this board.
For the mounted component on this board, refer to Section 3 of the maintenance manual volume-2.

1-25-20. PTC-54 Board

After replacing or repairing this board, check that error code 09 does not occur while the tape is threading.

1-25-21. PTC-59 Board

Note

Since the mounted PTC-59 board is out of service part, be sure to replace the MC sensor assembly when needing to replace this board.

After replacing the MC sensor assembly or repairing this board, check the functions of the cassette tab sensors using C000 : CASSETTE SW in the maintenance mode.
(Refer to “3-2-2. SERVO CHECK Mode (C00-03)”.)

1-25-22. PTC-69 Board

After replacing or repairing this board, perform the electrical adjustments (Section 4-3).

Note

When replacing the search dial assembly, the electrical adjustments for the PTC-69 board is not needed.

1-25-23. PTC-71 Board

After replacing or repairing this board, check the functions of the reel position sensors using C016 : REEL POSITION MOTOR of the maintenance mode.
(Refer to “3-2-2. SERVO CHECK Mode (C00-03)”.)

1-25-24. RM-181 Board

After replacing or repairing this board, perform “Adjustment after Replacement” in “5-15. Reel Motor Assembly Replacement”.

1-25-25. RM-130 Board

After replacing or repairing this board, check that the error (error code 92) does not exist after turning the power ON.

1-25-26. RM-179 Board

After replacing the board or its NV-RAM

Execute RESET ALL DATA of M392: NV-RAM CONTROL in the maintenance mode to reset to the factory setting data.
Refer to “3-4-8. 50PIN DATA ASSIGN Mode (M39)”.

After repairing the board (except to replacing the NV-RAM)

Check that the error (error code 95) does not exist after turning the power ON.

1-25-27. SDI-41 Board

After replacing the board

Perform the following check.

After repairing the board

Perform the SDI I/O line adjustment (Section 4-9).
Then perform the following check.

Preparing tools

- Digital component video signal generator:
  TEKTRONIX TSG-422 option-1S or equivalent
- Video monitor for the serial digital input:
  SONY BVM-1410 (with optional BKM-2085-14) or equivalent

Check

1. Set VIDEO INPUT SELECT to “SDI”.
2. Input the 4:2:2 component digital video signal to SDI INPUT connector from the digital component video signal generator.
3. Check that no abnormality exists in the picture watching the video monitor connected to each SDI OUTPUT connector. (active through out, 1, 2, and 3)

1-25-28. SE-344 Board

Note

Since the mounted SE-344 board and the component on this board are out of service parts, be sure to replace the reel FG assembly when needing to replace/repaire this board.

After replacing the reel FG assembly, perform “5-15-7. Reel Table Rotation Sensor Position Adjustment”.

1-25-29. SE-461 Board

After replacing or repairing this board, perform the following checks.

1. Check the function of the dew condensation sensor using C003 : DEW SENSOR in the maintenance mode.
   (Refer to “3-2-2. SERVO CHECK Mode (C00-03)”.)
2. Check that the VTR is able to record on the cassette tape.

1-25-30. SS-83 Board

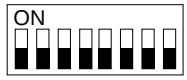
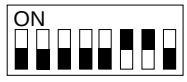
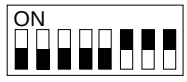
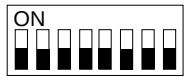
When replacing:

When replacing this board, perform the followings.

1. Check the settings of the setup menu (main and extended menus).
   Write the setting of the setup menu on a copy of “Appendix A. Setting Check Sheet” in the installation manual if possible.
2. Check that the DIP switches S101, S1100, S1900, and S2100 are set as following. Moreover set S1102 as following.

Note

- ■ marks stand for the position of knobs
- The description for each DIP switch is described in Section 1-14.

Ref No.	Setting	Remarks
S101		Factory setting
S1100		• Perform the setup menu reset which should be done after board replacement, then set No.1 switch to the same setting as the removed SS-83 board.
S1102	DNW-75  DNW-75P  TTV 4074 P 	Factory setting
S1900		Factory setting
S2100		Factory setting

After replacing

After replacing or repairing this board, perform the following checks.

1. Reset the setup menu (main and extended menus) as setting written on a copy of the setting check sheet.
2. Clear the error logger using the error logger display mode of the maintenance mode.
   Refer to “3-3. Error Logger Display Mode (M2)”.
3. Set the calendar/clock using the error logger display mode of the maintenance mode.
   Refer to “3-3. Error Logger Display Mode (M2)”.

After replacing the NV-RAM

Perform the service action after replacing referring to “1-18. NV-RAM”.

After repairing the board (except replacing the NV-RAM)

Perform the servo system electrical adjustment (Section 4-4).

1-25-31. SWC-31 Board

After replacing or repairing this board, check the functions of the switches and volumes on this board.

Note

Perform the system phase adjustment again for the VTR referring to the manual of the analog switcher when using the analog switcher with this VTR.

1-25-32. SWC-35 Board

After replacing or repairing this board, check the functions of the switches and indicators on this board.

1-25-33. TC-102 Board

After replacing or repairing this board, perform LTC alignment and full erase current check (Section 4-11).

1-25-34. TR-78 Board

Note

Since the mounted TR-78 board and the component on this board are out of service parts, be sure to replace the S-tension regulator assembly when needing to replace/repair this board. (Refer to Section 5-23.)

After replacing the S-tension regulator assembly, perform the tape running adjustment (Section 6-1-2).

1-25-35. TR-79 Board

After replacing or repairing this board, perform the following checks.

1. Check the functions of the threading and unthreading sensors using C012 : THREADING MOTOR in the maintenance mode.
   (Refer to “3-2-2. SERVO CHECK Mode (C00-03)”.)
2. Execute A008 : S/T TENSION OFFSET in the maintenance mode. Then, save the adjustment data in A012 : NV-RAM CONTROL.
   (Refer to “3-2-5. SERVO ADJUST Mode (A00-01)”.

1-25-36. VPR-47 Board

After replacing or repairing this board, perform the video system alignment (Section 4-7).

1-25-37. VR-223 Board

After replacing or repairing this board, check the functions of the switches and volumes on this board.

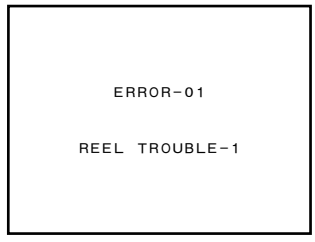
1-25-38. VR-224 Board

After replacing or repairing this board, check the functions of the switches and volumes on this board.

1-26. Error Message

1-26-1. Overview

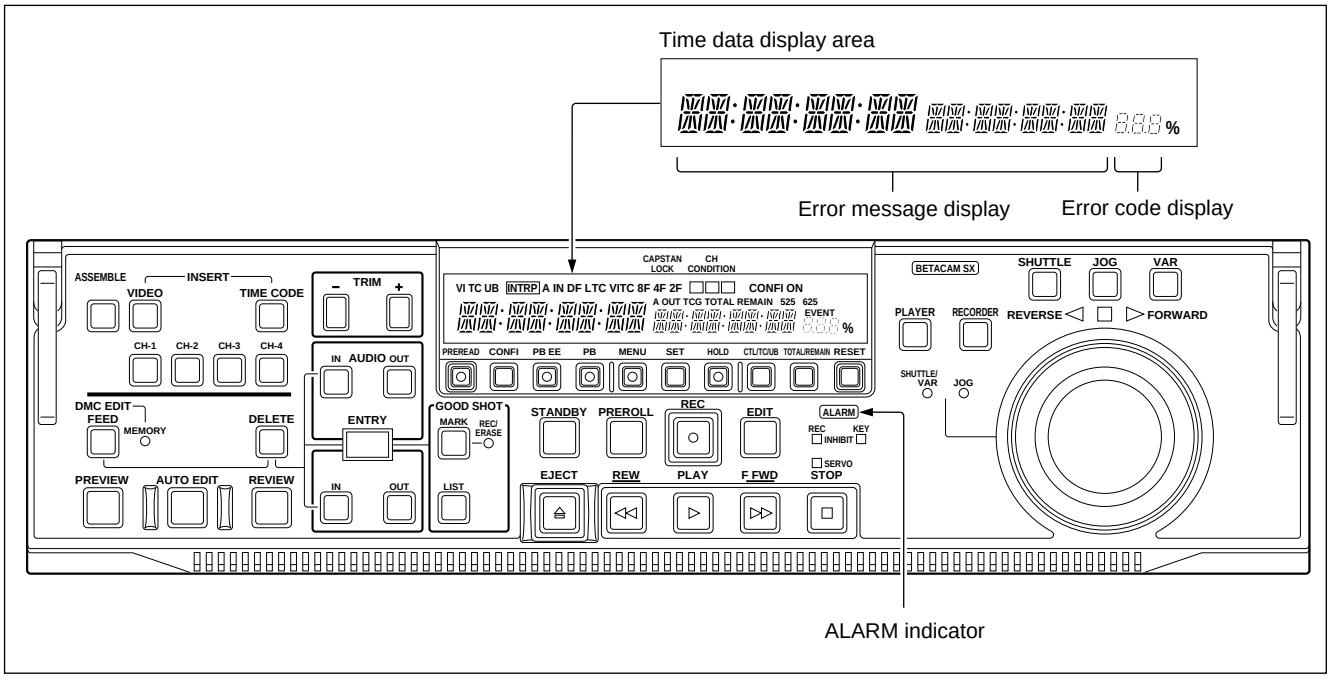
This unit has self-diagnostics function.
When trouble is detected, an ALARM indicator is lighted immediately on the lower control panel, and an error message and error code are displayed in the time data display area and event display area.
Also, an error code and error message are superimposed on the video monitor connected to the VIDEO OUTPUT COMPOSITE 3 (SUPER) connector. Furthermore, as for the some error codes, object which error occurred is displayed as sub error message on the video monitor.



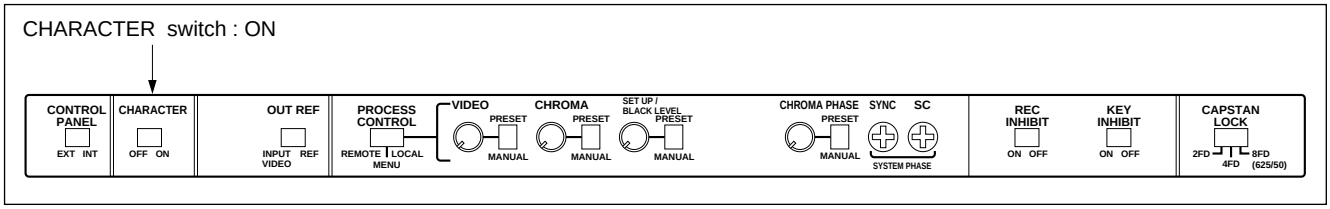
Ex. Superimposed on Video Monitor

Notes

- To superimpose the error message and code on the video monitor, the CHARACTER switch on the sub control panel must be set to ON.
- There are the error messages without error code. These messages are only displayed on the time data display area.
- The error messages with error code are memorized to NV-RAM (Non-volatile RAM) as the error logging data.
  (Refer to Section 3-3 for the error logging data.)
- The messages on the time data display area differ from the messages which are superimposed on the video monitor in some items.



Error Message/Code Display Area and ALARM Indicator



CHARACTER Switch on Sub Control Panel

Error messages are described on Section 1-26-2 in the order of list.

Error List

Code	Message on time data display area	Page	Description
–	NO COMMUNICATION	1-49	Abnormality in the interface between the lower control panel (KY-438 board) and SYS1 CPU (SS-83 board) is detected in the lower control panel side.
01	REEL TROUBLE	1-49	Tape slacking is detected in the threading or unthreading operation.
02	REEL TROUBLE	1-50	Tape slacking or tape breaking is detected in the SEARCH, FF, or REW mode.
03	REEL TROUBLE	1-51	Tape slacking, tape breaking, or supply or take-up reel locking is detected in the REC or PLAY mode.
04	REEL TROUBLE	1-52	A malfunctional tape transport speed is detected in the FF or REW mode.
05	REEL TROUBLE	1-52	The malfunctional operation of the supply or take-up reel is detected during cassette insertion.
06	TAPE TENSION	1-53	Excessive tape tension is detected in the REC or PLAY mode.
07	CAPSTAN TROUBLE	1-53	Malfunction of capstan motor is detected.
08	DRUM TROUBLE	1-54	Malfunction of drum motor is detected.
09	TH/UNTH MOTOR	1-54	Malfunction of threading or unthreading operation is detected.
0A	THREADING	1-55	It is detected that the tape top processing is not completed in the threading mode.
10	HUMID	1-55	Dew condensation is detected.
11	TAPE T/E SENSOR	1-56	The tape top and tape end are detected simultaneously.
12	TAPE TOP SENSOR	1-56	Malfunction of tape top sensor is detected.
13	TAPE END SENSOR	1-57	Malfunction of tape end sensor is detected.
14	FAN MOTOR	1-58	Malfunction of cooling fan motor is detected.
20	CASS COMP MOTOR	1-59	Malfunction of cassette compartment-up or down operation is detected.
21	REEL SFT MOTOR	1-59	Malfunction of movement of the reel table corresponding to the cassette size is detected.
22	REEL POS SENSOR	1-60	The L-cassette and S-cassette positions of the reel table are detected simultaneously.
23	THRED RING SENS	1-60	The thread end and unthread end states of the threading ring are detected simultaneously.
92	INTERNAL I/F 1	1-61	Abnormality in the interface between SYS1 CPU (on SS-83 board) and other CPU/MPU is detected.
93	CPU INITIALIZE ERROR	1-62	Abnormality in the interface between SV CPU (on SS-83 board) and DRUM CPU (on SS-83 board) is detected.
95	OTHERS NV-RAM ERROR	1-62	Abnormality operation of an NV-RAM on RM-179 board is detected.
96	SY NV-RAM ERROR	1-63	The abnormal operation of an NV-RAM (on SS-83 board) for the system control system is detected.
97	SV NV-RAM	1-64	The abnormal operation of an NV-RAM (on MS-58 board) for the servo system is detected.
98	RF NV-RAM ERROR	1-64	The abnormal operation of an NV-RAM (on EQ-75 board) for the RF system is detected.
99	INTERNAL I/F 2	1-65	Abnormality in the interface between SYS2 CPU (on SS-83 board) and SERVO CPU (on SS-83 board) or MPU (on EQ-75 or SDI-41 board) or FL (level meter module) is detected.

Notes

- Error codes 01 through 14 are detected in both/one of the SS-83 and/or MS-58 boards.
  Error codes 20 through 23 are detected in the MS-58 board.
  Error codes 92 through 99 are detected in the SS-83 board.
- There are two error groups of error codes: VTR and OTHERS. If errors occur in multiple error groups, the error message of each group are switched at two-second intervals.
  Also, if multiple errors occur in error group, the priority level of each group display are as follows:
  VTR: 97, 02, 03, 04, 05, 07, 06, 01, 09, 08, 0A, 10, 11, 12, 13, 14, 20, 21, 22, 23
  OTHERS: 92, 96, 98, 99, 93, 95

1-26-2. Details of Error Messages

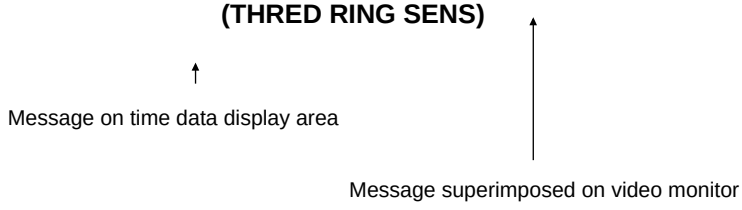
CAUTION

The “protection mode” described in this section means the servo control system automatically stops the tape transport and drum motor rotation, and maintains this state. The DNW cannot be automatically recovered to the normal state when the DNW once enters the protection mode. Be sure to turn on the power again under the absence of the cassette tape.
If the protection mode is entered with the cassette tape inserted, take out the cassette tape manually with reference to “1-12. Taking Out the Cassette in Tape Slacking”. Never turn on the power again without taking out the cassette tape. This may damage the tape.

Note

The messages on the time data display area differ from the messages which are superimposed on the video monitor in some items. In this section, each message indicates as following example.

Ex. : ERROR-23 THREADING RING POSITION ERROR
(THRED RING SENS)



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(NO COMMUNICATION)

Description: Abnormality in the interface between the lower control panel's MPU (KY-438 board) and SYS1 CPU (SS-83 board) was detected.

Note

This error message is only displayed on the time data display area in that the abnormality of the interface is detected in the lower control panel side.

Detecting condition: When the lower control panel's MPU (IC104 on KY-438 board) is received no interface signal from SYS1 CPU (IC704 on SS-83 board) for more than two seconds.

Possible causes:
- Cable connection defect or disconnection
- Line receiver/transceiver (IC102 on KY-438 board) trouble
- SIO (IC1102 on SS-83 board) trouble

Protecting operation: None

ERROR-01 REEL TROUBLE - 1 (REEL TROUBLE)

Description: Tape slacking was detected during threading or unthreading.

Detecting conditions:
1) When no take-up reel FG can be detected in the unthread operation just after activation.
2) When the relation between the take-up reel FG and threading FG is out of the specification in operations other than unthread just after activation.

Sub error message: None

Possible causes:
- Cassette compartment trouble or installation defect
  - ∗ The reel did not rotate because the cassette was lifted-up from the specified position.
- Clearance adjustment defect of take-up reel FG detection block
- Take-up reel FG waveform shaper circuit (MS-58 board) trouble
- Take-up reel motor trouble
- Take-up reel motor drive circuit (DR-315 board) trouble
- Take-up reel brake trouble
- Take-up reel brake solenoid drive circuit (MS-58 board) trouble
- Servo adjustment defect on take-up reel
- Harness disconnection
- Take-up reel table height adjustment defect

Protecting operation: Enters the protection mode.

CAUTION

Be sure to take out the cassette manually (refer to Section 1-12). Do not turn on the power again without taking out the cassette. This may damage the tape.

ERROR-02 REEL TROUBLE - 2 (REEL TROUBLE)

Description: Tape slacking or tape breaking was detected in SEARCH, FF, or REW mode.

Detecting conditions:
1) When the take-up value is lower than the specified value with respect to the tape supply value.
2) When the relation among the capstan FG, supply reel FG, and take-up reel FG are out of the specification.
3) When the supply reel and take-up reel do not coincide in rotation direction continuously for more than five seconds.

Sub error message: None

Possible causes:
- Cassette compartment trouble or installation defect
  - ✻ The reel did not rotate because the cassette was lifted-up from the specified position.
- Clearance adjustment defect of supply or take-up reel FG detection block
- Supply or take-up reel FG waveform shaper circuit (MS-58 board) trouble
- Supply or take-up reel motor trouble
- Supply or take-up reel motor drive circuit (DR-315 board) trouble
- Capstan motor trouble
- Capstan motor drive circuit (DR-315 board) trouble
- Capstan FG waveform shaper circuit (MS-58 board) trouble
- Take-up torque insufficiency during REW due to supply tension sensor or supply tension detector circuit (MS-58 board) trouble
- Servo adjustment defect on capstan, reel(s), and supply tension sensor
- Supply or take-up reel brake trouble
- Supply or take-up reel brake solenoid drive circuit (MS-58 board) trouble
- Harness disconnection
- Reel table height adjustment defect
- Tape path and drum troubles
- Tape abnormality (The winding state has a problem.)

Protecting operation: Enters the protection mode. The normal state may be returned after the protection mode is entered at the end of the tape.

CAUTION

Be sure to take out the cassette manually (refer to Section 1-12). Do not turn on the power again without taking out the cassette. This may damage the tape.

ERROR-03 REEL TROUBLE - 3 (REEL TROUBLE)

Description: Tape slacking, tape breaking, or supply or take-up reel locking was detected in the REC or PLAY mode.

Detecting conditions:
1) When the take-up value is lower than the specified value with respect to the tape supply value.
2) When the relation among the capstan FG, supply reel FG, and take-up reel FG are out of the specification.
3) When the supply reel and take-up reel do not coincide in rotation direction continuously for more than five seconds.
4) When the tension value calculated from the supply tension sensor output is less than 15 g continuously for more than three seconds.

Sub error message: None

Possible causes:
- Cassette compartment trouble or installation defect
  - ∗ The reel did not rotate because the cassette was lifted-up from the specified position.
- Clearance adjustment defect of supply or take-up reel FG detection block
- Supply or take-up reel FG waveform shaper circuit (MS-58 board) trouble
- Supply or take-up reel motor trouble
- Supply or take-up reel motor drive circuit (DR-315 board) trouble
- Capstan motor trouble
- Capstan motor drive circuit (DR-315 board) trouble
- Capstan FG waveform shaper circuit (MS-58 board) trouble
- Servo adjustment defect on capstan, reel(s), and supply tension sensor
- Supply or take-up reel brake trouble
- Supply or take-up reel brake solenoid drive circuit (MS-58 board) trouble
- Harness disconnection
- Reel table height adjustment defect
- Tape path and drum troubles
- Tape abnormality (The winding state has a problem.)

Protecting operation: Enters the protection mode.

CAUTION

Be sure to take out the cassette manually (refer to Section 1-12). Do not turn on the power again without taking out the cassette. This may damage the tape.

ERROR-04 REEL TROUBLE - 4 (REEL TROUBLE)

Description: Abnormal tape transport speed was detected in the FF or REW mode.

Detecting condition: When the tape speed calculated from the supply reel FG and take-up reel FG is under a half of the specified tape speed continuously for more than four seconds.

Sub error message: None

Possible causes:
- Cassette compartment trouble or installation defect
  - ✻ The reel did not rotate because the cassette was lifted-up from the specified position.
- Clearance adjustment defect of supply or take-up reel FG detection block
- Supply or take-up reel motor trouble
- Supply or take-up reel FG waveform shaper circuit (MS-58 board) trouble
- Supply or take-up reel motor drive circuit (DR-315 board) trouble
- Servo adjustment defect on supply or take-up reel
- Supply or take-up reel brake trouble
- Supply or take-up reel brake solenoid drive circuit (MS-58 board) trouble
- Harness disconnection
- Reel table height adjustment defect
- Tape path and drum troubles
- Tape abnormality (The winding state has a problem.)

Protecting operation: Stops the tape transport and enters the rest state.

ERROR-05 REEL TROUBLE - 5 (REEL TROUBLE)

Description: Abnormal supply reel or take-up reel operation was detected in a diagnosis during cassette insertion.

Detecting conditions:
1) When the supply reel FG or take-up reel FG count is less than the specified value with the reel rotated.
2) When the supply reel FG or take-up reel FG count is more than the specified value with the reel stopped.

Sub error message: None

Possible causes:
- Supply or take-up reel FG sensor (SE-461 board) trouble or clearance adjustment defect
- Supply or take-up reel FG waveform shaper circuit (MS-58 board) trouble
- Supply or take-up reel motor drive circuit (DR-315 board) trouble
- Servo adjustment defect on supply or take-up reel
- Supply or take-up reel brake trouble
- Supply or take-up reel brake solenoid drive circuit (MS-58 board) trouble
- Harness disconnection

Protecting operation: Ejects the cassette.

ERROR-06 TAPE TENSION ERROR (TAPE TENSION)

Description: Excessive tension was detected in the REC or PLAY mode.

Detecting condition: When the tension value calculated from supply tension sensor output is more than 55 g continuously for more than three seconds.

Sub error message: None

Possible causes:
- Cassette compartment trouble or installation defect
  - ∗ The reel did not rotate because the cassette was lifted-up from the specified position.
- Supply tension sensor or its related circuit (MS-58 board) trouble
- Supply reel motor trouble
- Supply reel motor drive circuit (DR-315 board) trouble
- Servo adjustment defect on supply reel and supply tension sensor
- Supply reel brake trouble
- Supply reel brake solenoid drive circuit (MS-58 board) trouble
- Harness disconnection

Protecting operation: Stops the tape transport and enters the rest state.

ERROR-07 CAPSTAN TROUBLE (CAPSTAN TROUBLE)

Description: Malfunction of capstan motor was detected.

Detecting conditions:
1) When the capstan FG count is less than the specified value in a diagnosis during cassette insertion.
2) When the frequency calculated from the capstan FG is out of the specification in the REC, PLAY, or SEARCH mode.
3) When CAPSTAN FG(A) NOR signal and CAPSTAN FG(B) NOR signal interruption are not normal for about 40 ms in the REC or PLAY mode.

Sub error message: None

Possible causes:
- Capstan motor trouble
- FG sensor trouble in capstan motor
- Capstan motor drive circuit (DR-315 board) trouble
- Capstan motor FG waveform shaper circuit (MS-58 board) trouble
- Capstan FG duty adjustment defect

Protecting operations: Ejects the cassette for No. 1 in detecting conditions.
Stops the tape transport and enters the rest state for No. 2 and No. 3 in detecting conditions.

ERROR-08 DRUM TROUBLE (DRUM TROUBLE)

Description: Malfunction of drum motor was detected.

Detecting condition: When the drum FG cycle is shifted more than about ±30 % continuously for more than 10 seconds as compared with during normal rotation.

Sub error message: None

Possible causes:
- Drum motor trouble
- Drum microcomputer (IC314 on SS-83 board) trouble
- Drum motor drive circuit (DR-315 board) trouble
- Drum FG/PG waveform shaper circuit (DR-315 board) trouble
- Assembly defect during upper drum replacement

Protecting operation: Stops the tape transport and enters the rest state in the unthread end state.

ERROR-09 TH/UNTH MOTOR TIME OUT (TH/UNTH MOTOR)

Description: Malfunction of threading or unthreading operation was detected.

Detecting conditions:
1) When no operation is completed within about six seconds after operation start.
2) When no threading FG is output within about 0.4 second during threading motor drive.
3) When states other than unthread end are continued for more than six seconds in case that the unit should be in the unthread end state.

Sub error message: None

Possible causes:
- Unthread end sensor (TR-79 board) trouble
- Thread end sensor (TR-79 board) trouble
- Thread end/unthread end input port (IC1 on MS-58 board) trouble
- Threading motor trouble
- Threading FG sensor (PTC-54 board) trouble
- Threading FG waveform shaper circuit (MS-58 board) trouble
- Threading motor drive circuit (DR-315 board) trouble
- Threading mechanism trouble

Protecting operations: Ejects the cassette during cassette insertion or ejection.
Enters the protection mode during tape threading/unthreading.
Stops the tape transport and enters the rest state in cases except the above.

ERROR-0A THREADING TROUBLE (THREADING)

Description: It was detected that the tape top processing in the thread state is not completed.

Detecting condition: When the tape top is detected again after it is processed.

Tape top processing

In this processing, the tape is slightly forwarded without taking out the tape after unthread because the tape top was detected during threading.
(Short FF)

Sub error message: None

Possible causes:
- Take-up reel motor trouble
- Servo adjustment defect on take-up reel
- Take-up reel motor drive circuit (DR-315 board) trouble
- Tape top sensor trouble
- Tape top detection circuit (MS-58 board) trouble
- Tape top input port (IC115 on SS-83 board) trouble
- Tape abnormality

Protecting operation: Enters the rest state in the unthread end state.

ERROR-10 HUMID (HUMID)

Description: Dew condensation was detected.

Detecting condition: When the condensation sensor detects dew condensation continuously for about two seconds.

Sub error message: None

Possible causes:
- Actual dew detection (When the operating environment rapidly changes from low temperature to high temperature and high humidity)
- Condensation sensor trouble
- Dew input port (IC1 on MS-58 board) trouble

Protecting operations: Prohibits the cleaning roller operation.
Stops the tape transport and enters the rest state in the unthread end state when the tape is threaded in states other than PLAY and REC mode.
Prohibits the tape threading.
Prohibits the cassette insertion.

ERROR-11 TAPE TOP/END SENSOR TROUBLE (TAPE T/E SENSOR)

Description: The tape top and tape end were detected simultaneously.

Detecting condition: When the simultaneous detection of the tape end and tape top is continued for more than seven seconds.

Sub error message: None

Possible causes:
- Tape top sensor or tape end sensor trouble
- Tape top or tape end detection circuit (MS-58 board) trouble
- Tape top/tape end input port (IC115 on SS-83 board) trouble
- Harness disconnection

Protecting operation: Stops the tape transport and enters the rest state during tape transport.

ERROR-12 TAPE TOP SENSOR TROUBLE (TAPE TOP SENSOR)

Description: Malfunction of tape top sensor was detected.

Detecting condition: When the tape top is detected continuously for more than seven seconds.

Sub error message: None

Possible causes:
- Tape top sensor trouble
- Tape top detection circuit (MS-58 board) trouble
- Tape top input port (IC115 on SS-83 board) trouble
- Harness disconnection
- The tape cannot move at the tape top due to troubles other than the tape sensor.

Protecting operations: In the FF mode, continues the operation until the tape end is detected. Stops the tape transport and enters the rest state when the tape end is detected.
During tape transport in forward direction, the FF mode can be entered only while the total tape quantity is observed.
Stops the tape transport and enters the rest state during tape transport except the above.

ERROR-13 TAPE END SENSOR TROUBLE (TAPE END SENSOR)

Description: Malfunction of tape end sensor was detected.

Detecting condition: When the tape end is detected continuously for more than seven seconds.

Sub error message: None

Possible causes:
- Tape end sensor trouble
- Tape end detection circuit (MS-58 board) trouble
- Tape end input port (IC115 on SS-83 board) trouble
- Harness disconnection
- The tape cannot move at the tape end due to troubles other than the tape sensor.

Protecting operations: In the REW mode, continues the operation until the tape top is detected. Stops the tape transport and enters the rest state when the tape top is detected.
During the tape transport in reverse direction, the REW mode can be entered only while the total tape quantity is observed.
Stops the tape transport and enters the rest state during tape transport except the above.

ERROR-14 FAN MOTOR TROUBLE (FAN MOTOR)

Description: Malfunction of cooling fan motor was detected.

CAUTION

If this error occurred, stop immediately operation of the unit, and turn off the power.
If the unit uses continuously under the fan is stopped state, overhearting inside the unit can cause a fire or a failure.

Detecting condition: When the fan motor FG frequency is less than the specified value continuously for more than one second.

Sub error message: None

Possible causes:
- Fan motor trouble
- Fan motor FG input port (IC115 or IC500 on SS-83 board) trouble
- Fan motor control port (IC500 on SS-83 board) trouble
- Fan motor power switch circuit (MB-818 board) trouble

Protecting operation: None

Note

This unit has three fan motors.
When the above detecting condition is satisfied by any fan motor, this error occurs.
Relations of fan motors and operation state, ports, power switch circuit are as follows.

Use	Operation state	FG input port	Control port	Power switch circuit
For rear	Always rotating	IC500/SS-83 board	None	None
For mechanical deck	Always rotating	IC115/SS-83 board	IC500/SS-83 board	Q1 and Q2/MB-818 board
For power supply unit	Always rotating	IC115/SS-83 board	None	None

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ERROR-20 CASSETTE COMPARTMENT MOTOR LOCK (CASS COMP MOTOR)

Description: Malfunction of cassette compartment-up or down operation was detected.

Detecting condition: When no operation is completed within about six seconds after operation start.

Sub error message: None

Possible causes:
- Cassette compartment block trouble
- Cassette compartment motor drive circuit (DR-315 board) trouble
- Cassette-down sensor (CL-29 board) trouble
- Cassette-down input port (IC1 on MS-58 board) trouble

Protecting operation: Stops the movement of the cassette compartment and reel table until a cassette eject button is pushed.

ERROR-21 REEL SHIFT MOTOR LOCK (REEL SFT MOTOR)

Description: Malfunction of movement of the reel table corresponding to the cassette size was detected.

Detecting condition: When no operation is completed within about six seconds after operation start.

Sub error message: None

Possible causes:
- Reel shift mechanism trouble
- Reel shift motor trouble
- Reel shift motor drive circuit (DR-315 board) trouble
- Reel position sensor (PTC-71 board) trouble (S position sensor or L position sensor)
- Reel position input port (IC1 on MS-58 board) trouble

Protecting operation: Stops the movement of the reel table and ejects the cassette during cassette loading.

ERROR-22 REEL POSITION SENSOR TROUBLE (REEL POS SENSOR)

Description: The L and S cassette positions of the reel table were detected simultaneously.

Detecting condition: When the L and S position sensors detect the L and S cassette positions, respectively at the same time.

Sub error message: None

Possible causes:
- S position sensor (PTC-71 board) trouble
- L position sensor (PTC-71 board) trouble
- Reel position input port (IC1 on MS-58 board) trouble

Protecting operation: If possible, ejects the cassette, when an error occurs during cassette insertion.
Prohibits the cassette insertion.

ERROR-23 THREADING RING POSITION ERROR (THRED RING SENS)

Description: The thread end and unthread end states were detected simultaneously.

Detecting condition: When the thread end and unthread end sensors detect the thread end and unthread end states, respectively at the same time.

Sub error message: None

Possible causes:
- Thread end sensor (TR-79 board) trouble
- Unthread end sensor (TR-79 board) trouble
- Thread end or unthread end input port (IC1 on MS-58 board) trouble

Protecting operations: Ejects the cassette during cassette insertion or ejection.
Enters the protection mode during tape threading/unthreading.
Stops the tape transport and enters the rest state in cases except the above.

ERROR-92 INTERNAL INTERFACE ERROR 1 (INTERNAL I/F 1)

Description: Abnormality was detected in the communication between SYS1 CPU (IC704 on SS-83 board) and other CPU/MPU.

Sub error messages and Detecting conditions:

SY2:	When the SYS2 CPU (IC1505 on SS-83 board) initialization at power-on is in abnormal state.
KY:	When the communication with KY-438 board's MPU (IC104) is in abnormal state.
FP:	When the communication with FP-117 board's MPU (IC6) is in abnormal state.
50PIN:	When the communication with RM-130 board is in abnormal state.
RM NVRAM:	When the communication with RM-179 board is in abnormal state.

Possible causes:

SY2:
- DIP switch (S1900 on SS-83 board) setting defect
- Common RAM (IC2500 on SS-83 board) trouble
- System control system SY-2 area (IC1500 series on SS-83 board) trouble

KY:
- Cable (between MB-818 board and KY-438 board) connection defect or disconnection
- Interface circuit (IC1102 through 1105 on SS-83 board) trouble
- Line receiver/transceiver (IC102 on KY-438 board) trouble
- KY-438 board's MPU (IC104) trouble

FP:
- Cable (between MB-818 board and FP-117 board) connection defect or disconnection
- MPU control interface circuit (IC1400 through 1402 on SS-83 board) trouble
- FP-117 board's MPU (IC6) trouble

50PIN:
- MPU control interface circuit (IC1400 through 1402 on SS-83 board) trouble
- RM-130 board's MPU (IC2) trouble

RM NVRAM:
- MPU control interface circuit (IC1400 through 1402 on SS-83 board) trouble
- IC1 or IC2 on RM-179 board trouble

Protecting operations: When the sub error message is "**SY2**", enters the protection mode.
When it is except above, displays only this error.

ERROR-93 CPU INITIALIZE ERROR (CPU INITIALIZE ERROR)

Description: Abnormality was detected in the communication between SV CPU (SS-83 board) and DRUM CPU (SS-83 board).

Sub error message and Detecting condition:

DRUM: When the communication with DRUM CPU (IC314 on SS-83 board) at power-on is in abnormal state.

Possible cause: **DRUM**: IC314 and its peripheral circuit on SS-83 board trouble

Protecting operation: Prohibits the cassette insertion.

ERROR-95 OTHERS NV-RAM ERROR (OTHERS NV-RAM ERROR)

Description: The abnormal operation of an NV-RAM on RM-179 board was detected.

Sub error message and Detecting condition:

REMOTE-2 DATA RESET: When the REMOTE-2 (50-pin) setting data in an NV-RAM on RM-179 board is abnormal and the setting data is reset.

Possible cause: IC1 or IC2 on RM-179 board trouble

Protecting operation: Resets the 50-pin parallel remote (REMOTE-2) setting data to the factory setting.

ERROR-96 SY NV-RAM ERROR (SY NV-RAM ERROR)

Description: The abnormal operation of an NV-RAM (IC710 on SS-83 board) for the system control system was detected.

Sub error messages and Detecting conditions:

CURRENT SETUP: When the data error occurs in the setup menu current memory area during the data write or read .

SETUP BANK1: When the data error occurs in the setup menu bank 1 memory area during the data write or read.

SETUP BANK2: When the data error occurs in the setup menu bank 2 memory area during the data write or read.

SETUP BANK3: When the data error occurs in the setup menu bank 3 memory area during the data write or read.

SETUP BANK4: When the data error occurs in the setup menu bank 4 memory area during the data write or read.

ID CODE: When the data error occurs in the ID code memory area during the data write or read.

CALENDAR CLOCK: When the calendar/clock function was stopped.

Possible causes:

- NV-RAM (IC710 on SS-83 board) trouble
- Address decoder (IC1107 on SS-83 board) trouble
- Backup battery inside NV-RAM is out of life

Protecting operations: When the error occurs in setting data of the setup menu, resets those data to the factory settings.
When the error occurs in ID data, resets the data to 00 00 00 00.
When the error occurs at the calendar/clock function, resets the date and time data to ’96 11 01 00 00 00 (= Year, Month, Day, Hour, Minute, Second).

ERROR-97 SV NV-RAM ERROR (SV NV-RAM)

Description: The abnormal operation of an NV-RAM (MS-58 board) for the servo system was detected.

Detecting condition: When the checksum of NV-RAM data does not coincide during activation.

Sub error message: None

Possible cause: NV-RAM (IC9 on MS-58 board) trouble

Protecting operation: Enters the protection mode.

ERROR-98 RF NV-RAM ERROR (RF NV-RAM ERROR)

Description: The abnormal operation of an NV-RAM (EQ-75 board) for RF system was detected.

Sub error message and Detecting condition:

EQ: When the error occurs in an NV-RAM (IC900 on EQ-75 board) during the data write or read.

Possible cause: Trouble of the NV-RAM (EQ-75 board) for RF system

Protecting operation: None

ERROR-99 INTERNAL INTERFACE ERROR 2 (INTERNAL I/F 2)

Description: Abnormality was detected in the communication between SYS2 CPU (SS-83 board) and SERVO CPU (SS-83 board) or MPU (on EQ-75 or SDI-41 board) or FL (level meter module).

Sub error messages and Detecting conditions:

SV: When the SERVO CPU (IC103 on SS-83 board) initialization at power-on is in abnormal state.

EQ: When the communication with EQ-75 board's MPU (IC908) is in abnormal state.

SDI: When the communication with SDI-41 board's MPU (IC455) is in abnormal state.

FL: When the communication with FL (level meter module) is in abnormal state.

Possible causes:

SV:
- DIP switch (S101 on SS-83 board) setting defect
- Common RAM (IC2503 on SS-83 board) trouble
- Servo system (IC100 series or IC300 series on SS-83 board) trouble

EQ:
- MPU control interface circuit (IC2102, 2107, 2108 on SS-83 board) trouble
- Interface buffers (IC901, 902, 905 on EQ-75 board) trouble
- EQ-75 board's MPU (IC908) trouble

SDI:
- MPU control interface circuit (IC2102, 2107, 2108 on SS-83 board) trouble
- SDI-41 board's MPU (IC455) trouble

FL:
- Cable (between FP-117 board and level meter module) connection defect or disconnection
- Level meter module trouble

Protecting operations: When the sub error message is "**SV**", enters the protection mode.
When it is except above, displays only this error.

1-27. ISR

Overview

This unit corresponds to ISR (Interactive Status Reporting) function. When this unit is connected to the personal computer which activates Sony's ISR application software, the status of this unit or the contents of a generated error can be intensively monitored and managed on the monitor screen of a personal computer. The data displayed on the monitor screen can be stored as a file.

Note

As for ISR application software, method of using or installing the personal computer which can use this software, and the method of concrete operating, refer to ISR protocol manual.
For obtaining it, contact your local Sony Sales Office/Service Center.

The major functions are as follows:

Monitor functions

- Error code and error message (Refer to Section 1-26.)
- Display of operation status (Equivalent to the display on the video monitor.)

Management functions

- Model name, serial No., destination
- ROM version

Indicating item	Description
Manufacture	Displayed as SONY.
Model name	Displays the model name.
Serial No.	Displays the serial No.
Divece ID	Can give an arbitrary name to this unit and register it.
Destination	Displays the destination. J (For Japan), SY (For Overseas)
ROM	Displays the information of the ROMs mounted in this unit.

Inspection functions

- Hours meter (Equal to hours meter of the setup menu)
- Error logger

Section 2
Periodic Maintenance and Inspection

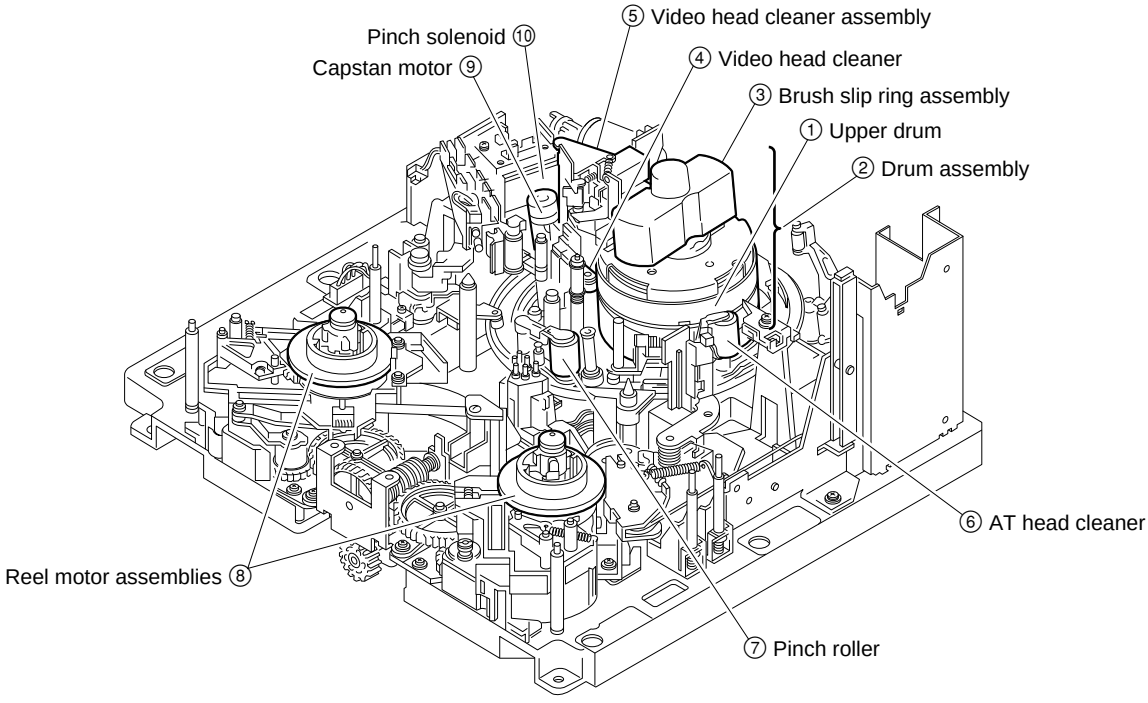
This section explains about periodic maintenance and how to clean.

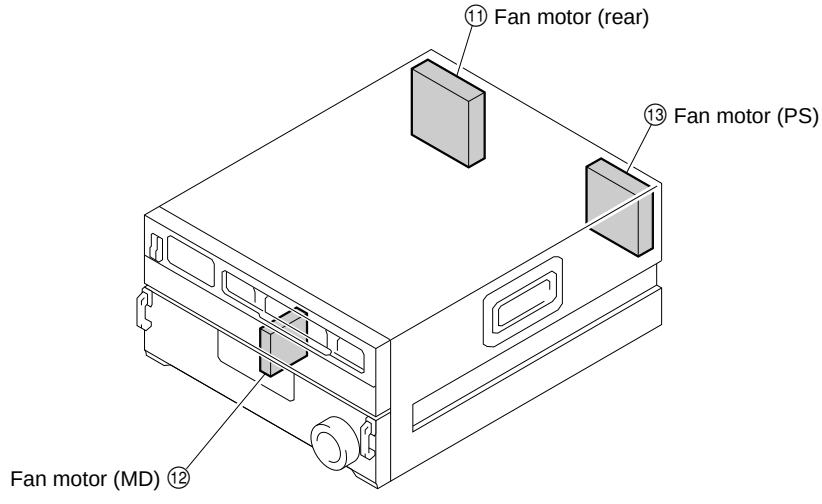
2-1. Periodic Maintenance

To make the most of the functions, fully realize the performances of this unit and to lengthen the life of the unit, periodic check and parts replacement are recommended.

2-1-1. Index

It is necessary to check and replace periodically to the following parts.
The numbers in the illustration correspond to the table in the next page.





2-1-2. Periodic Replacement and Check Item Table

The replacement time shown in the following table is not the guarantee term of parts. The replacement time of parts varies depending on the operating environment and conditions of the unit.
Especially the pinch roller and cleaners, may be required replacing earlier than replacement period shown in the table depending on the degree of their dirt or abrasion.
The arrows "↓" and "↑" in the table indicate that the part is included in the assembly described on the lower/upper line. If the assembly on the pointed line is replaced, the part is also replaced as a component of the assembly together.
As for the hours meter, refer to Section 2-1-3.
As for replacing each part, refer to Section 5.

R : Replace the part. C : Perform check (adjustment).
Replace it depending on its condition.

No.	Replacement parts	Hours meter (Menu No.)	Inspection hours (h) 1000	2000	3000	4000	5000	6000
①	Upper drum	Drum rotating time (H02)		C *1	C *1	C *1	C *1	C *1 (↓)
②	Drum assembly *2	Drum rotating time (H02)						C *3
③	Brush slip ring assembly	Drum rotating time (H02)						R (↑)
④	Video head cleaner	Drum rotating time (H02)	C *4	C *4	C *4	C *4	C *4	↓
⑤	Video head cleaner assembly *5 *6	Drum rotating time (H02)						R
		Threading times (H04)	Replace when used 200,000 times					
⑥	AT head cleaner	Drum rotating time (H02)	C *4	R	C *4	R	C *4	R
⑦	Pinch roller	Tape running time (H03)	C *4	R	C *4	R	C *4	R
⑧	Reel motor	Tape running time (H03)				R		
⑨	Capstan motor	Tape running time (H03)						R
⑩	Pinch solenoid *6	Tape running time (H03)						R
		Threading times (H04)	Replace when used 200,000 times					
⑪	Fan motor (rear)	Energized time (H01)	Replace when used 40,000 hours					
⑫	Fan motor (MD)	Energized time (H15)	Replace when used 40,000 hours					
⑬	Fan motor (PS)	Energized time (H01)	Replace when used 40,000 hours					

∗1: Refer to Section 2-3 to measure and check the video head tip protrusion.
∗2: Drum assembly includes an upper drum and a brush slip ring assembly.
∗3: Check (adjust) the video tracking referring to Section 6-1-3.
∗4: Check that the shape is not deformed and that is not dirty by visual.
∗5: Video head cleaner assembly includes a video head cleaer.
∗6: Replace these parts when the replacement period or count is reached whichever is earlier.

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Part No.	Name	Q'ty	Note
A-8323-268-A	Upper drum DJR-24A-R	1	
A-8323-266-A	Drum DJH-24A-R	1	
A-8277-462-A	Ring (3) assembly (RP), brush slip	1	
A-8320-546-A	Roller (B) assembly (RP), V cleaning	1	
3-182-765-02	Spacer, CR	1	
A-8320-545-A	Video head cleaner (B) assembly (RP)	1	
X-3167-053-2	Arm assembly, CL	1	
X-3167-054-4	Arm assembly, pinch	1	
A-8267-774-E	RM assembly	2	
1-698-179-12	Motor, DC (capstan)	1	
1-454-338-00	Solenoid, plunger	1	
1-763-170-11	Fan, DC (92 square)	1	
1-698-786-11	Fan, DC (60 square)	1	
1-698-785-41	Fan, DC (80 square)	1	

Replace the parts shown in the table below periodically when the threading/un-threading operation is repeated frequently.

Replacement parts	Replacement period	Part No.	Name	Q'ty
Brake solenoid	Every 200,000 times of threading	1-454-417-31	Solenoid, Plunger	1
S tension regulator	Every 200,000 times of threading	A-8267-795-E	Tension regulator assembly (RP)	1
T tension regulator	Every 200,000 times of threading	A-8267-423-B	T-tension regulator assembly	1
T drawing arm assembly	Every 200,000 times of threading	A-8278-313-A	Drawer assembly (T)	1
Gear box assembly	Every 200,000 times of threading	A-8267-424-A	Box assembly, Gear	1
Threading ring assembly	Every 200,000 times of threading	A-8267-395-F	Ring assembly, Threading	1
Ring roller	Every 200,000 times of threading	3-180-677-01	Roller, Ring	2
		3-180-679-01	Roller (B), Ring	1
Pinch arm guard	Every 200,000 times of threading	3-180-853-01	Guard, Pinch arm	1
CL guide rail	Every 200,000 times of threading	3-180-874-02	Rail, CL guide	1
Cassette compartment assembly	Every 200,000 times of threading	A-8267-589-F	Cassette compartment (RP)	1
Video head cleaner	Every 1,000 hours of drum rotating	A-8320-546-A	Roller (B) assembly (RP), V cleaning	1
		3-182-765-02	Spacer, CR	1
AT head cleaner	Every 1,000 hours of drum rotating	X-3167-053-2	Arm assembly, CL	1
Pinch roller	Every 1,000 hours of drum rotating	X-3167-054-4	Arm assembly, Pinch	1

2-1-3. Hours Meter

This unit can display an hours meter on the time data display area of the lower control panel. Perform a periodic check with this hours meter as a reference.

1. Contents of display

Menu No.	Display	Contents
H01	OPERATION HOURS	Sum of energized time
H02	DRUM RUNNING HOURS	Sum of drum rotating time
H03	TAPE RUNNING HOURS	Sum of tape running time
H04	THREADING COUNTER	Sum of threading
H12	DRUM RUNNING HOURS	Sum of drum rotating time (Resettable)
H13	TAPE RUNNING HOURS	Sum of tape running time (Resettable)
H14	THREADING COUNTER	Sum of threading (Resettable)
H15	TTP FAN OPERATION HOURS	Sum of TTP fan operating time (Resettable)

2. Display procedure

1. Press the MENU button on the lower control panel.
2. Put the "∗" to the desired ITEM by turning the search dial.
3. Press the SET button on the lower control panel to display the hours meter.
4. Press the MENU button once and repeat from step 2 to display other ITEM.
   Press the MENU button twice to exit the MENU.

2-2. Cleaning

To make the most of the functions, fully realize the performance of this unit, and to lengthen the life of the unit and tape, clean the components often.

2-2-1. Cleaning using Cleaning Tape

If the video heads are clogged, clean the video head as the following procedure. Make sure to use the specified cleaning tape. If other tape is used, unusual abrasion or damage of the video heads may occur.

Specified cleaning tape: BCT-5CLN

Procedure

1. Insert the cleaning tape BCT-5CLN into the unit.
2. Press the EJECT and PLAY buttons simultaneously.
   The cleaning tape is played back for approx. 5 seconds. After that, the cleaning tape will be ejected automatically.
   Notes
   - If the cleaning tape is not ejected after playing back more than 5 seconds, press the EJECT button immediately to eject the cleaning tape.
   - Do not fast-forward or rewind the cleaning tape and leave it into the unit in the STOP mode to avoid damage to the video head.
3. Check to see that the head clogging is clear.

If the video heads are still clogged after cleaning using a cleaning tape, clean them using a cleaning cloth. (Refer to Section 2-2-3.)

2-2-2. General Information for Cleaning using Cleaning Cloth

1. Cautions

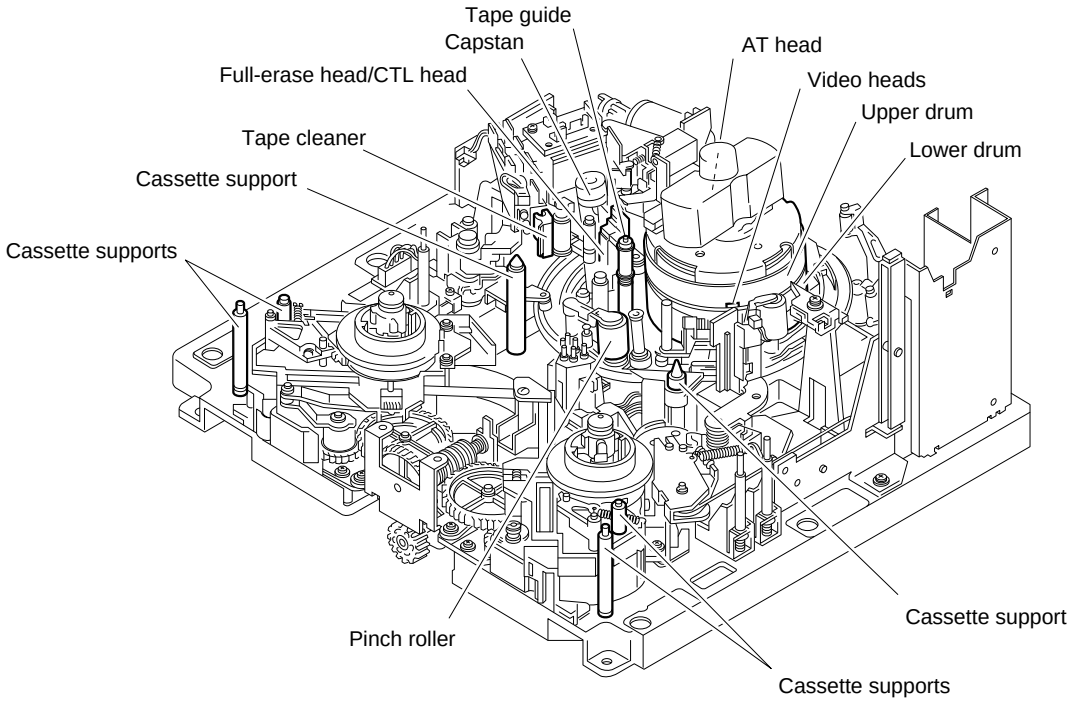
- Be sure to turn the power off before cleaning.
- Each block in the mechanical deck consists of a precision part and is adjusted precisely. Be careful not to damage each part and to apply an excessive force during cleaning.
- Do not contact the greased portions during cleaning. If the grease smears to a cleaning cloth, use a new cloth to avoid allow the grease to contact places where it should not.
- Do not insert a cassette tape before a cleaning fluid completely evaporates after cleaning.

2. Preparation

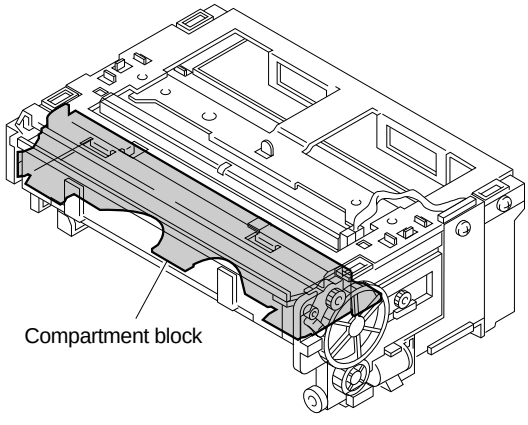
1. Turn the power off.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

3. Cleaning Parts

< Mechanical Deck Block >



< Cassette Compartment >



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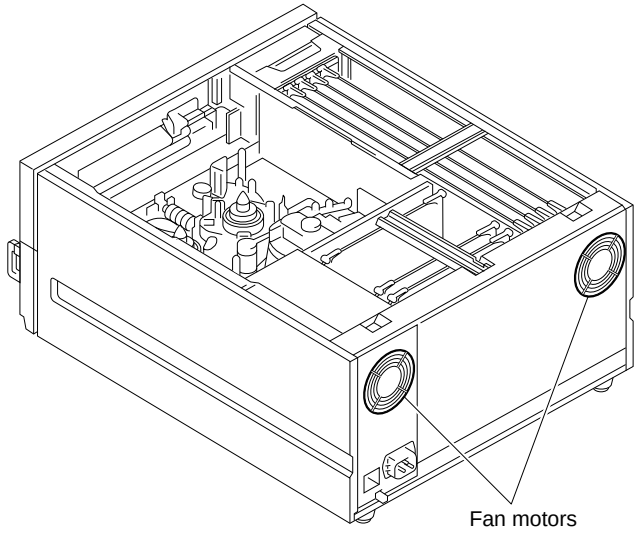


2-2-3. Tape Running Surface of Upper Drum and Video Heads Cleaning

WARNING

Never contact the rotating drum.
Be sure to turn off the power and wait until the drum comes to a complete stop befer cleaning.

Caution

The video heads are the part that can be damaged easily. Be careful not to damage the video heads during cleaning.

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Note

Never use a cotton swab to clean the video heads.

Procedure

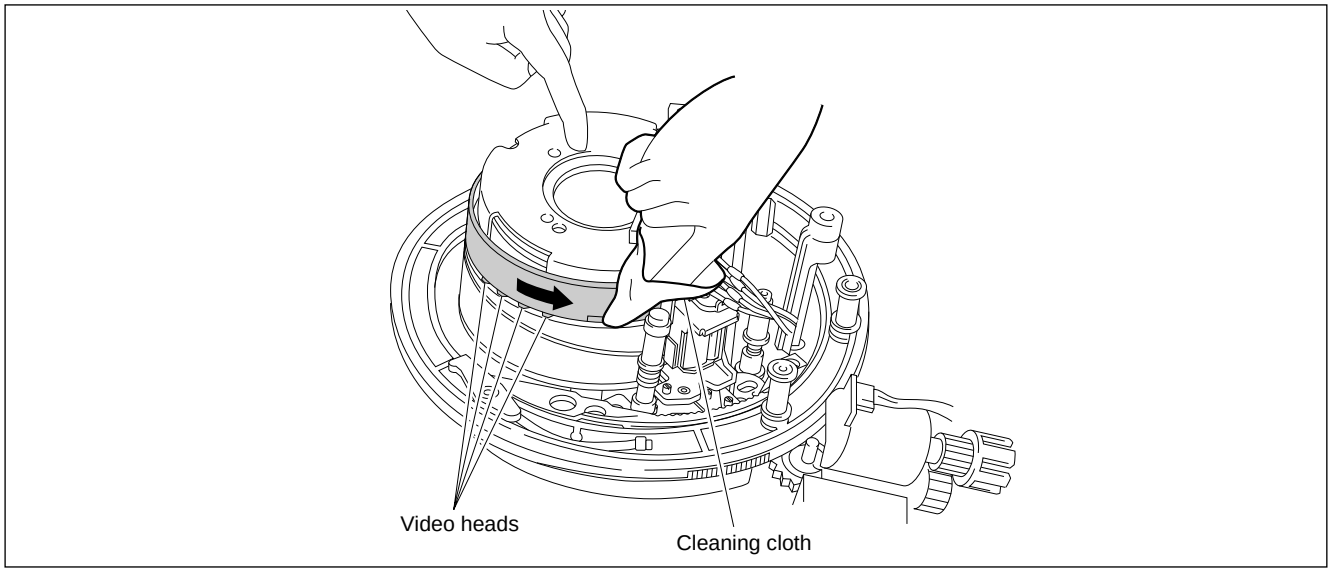
1. Hold the cleaning cloth moistened with a cleaning fluid keeping it without becoming wrinkled. And then slightly press the cleaning cloth against the video heads.

2. Slowly rotate the upper drum counterclockwise two or three turns and clean the tape-running surface and video heads without moving the cleaning cloth.

   Note

   Be sure to rotate the upper drum counterclockwise and clean the video heads along the circumference. Do not rotate it in the opposite direction (clockwise) or clean the video heads in the vertical direction to avoid damaging the video heads and brush slip ring assembly.

3. After cleaning, wipe them using a dry cleaning cloth two or three times.



Video Heads Cleaning

2-2-4. Tape Running Surface of Lower Drum and Lead Surface Cleaning

Caution

Be careful not to damage the lower drum (especially lead surface) during cleaning. Pay careful attention when cleaning the edge portion above the lower drum because it is located near the video heads.

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Skewer or an equivalent (Not metallic.)

Procedure

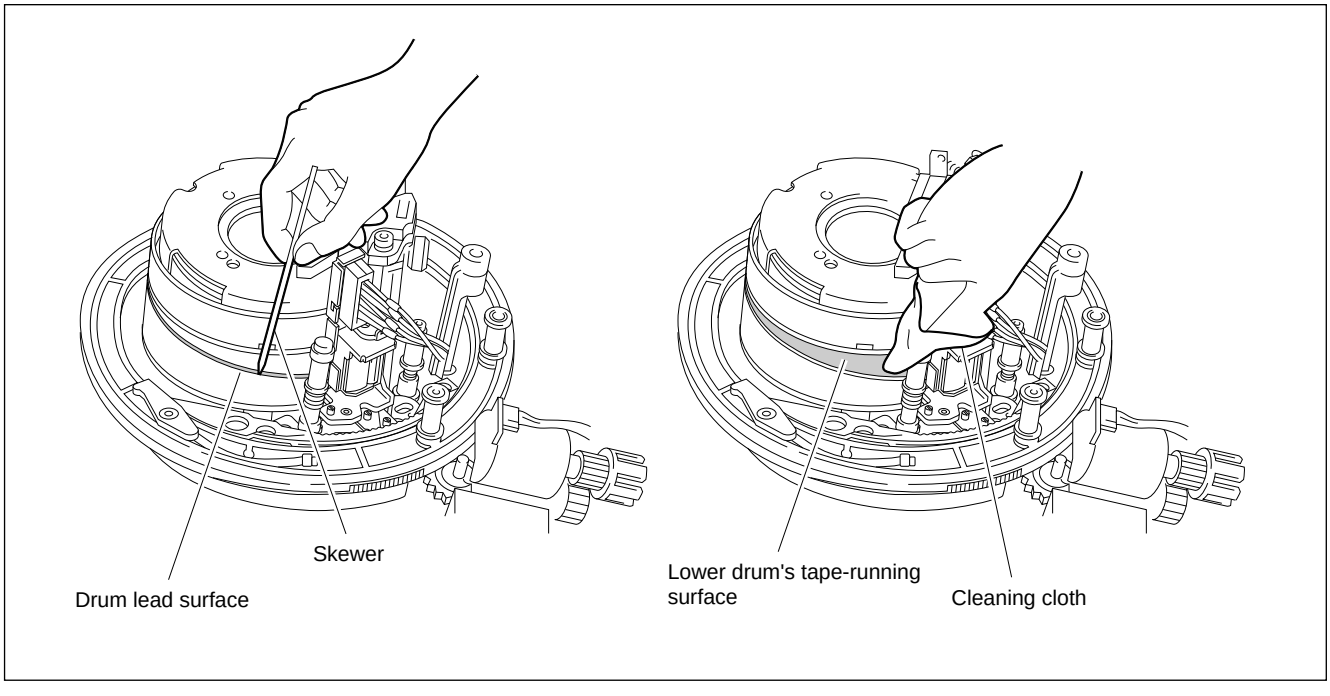
1. As shown in the figure, remove the maghetic powder using a skewer, running the skewer on the drum lead surface.

   Notes

   - Never use a metallic skewer to aviod damaging the tape-running surface.
   - Be sure to remove the magnetic powder completely. Tracking may be badly influenced if magnetic powder attaches to the drum lead surface.

2. Clean the drum lead surface and lower drum's tape-running surface (shaded portion in the figure) using a cleaning cloth moistened with a cleaning fluid.

3. After cleaning, wipe them using a dry cleaning cloth two or three times.



Tape-running Surface of Lower Drum and Lead Surface Cleaning

2-2-5. Stationary Heads Cleaning

Caution

• Be careful not to damage the head surface when cleaning the stationary heads.

Tools

• Cleaning cloth: 3-184-527-01
• Cleaning fluid: 9-919-573-01

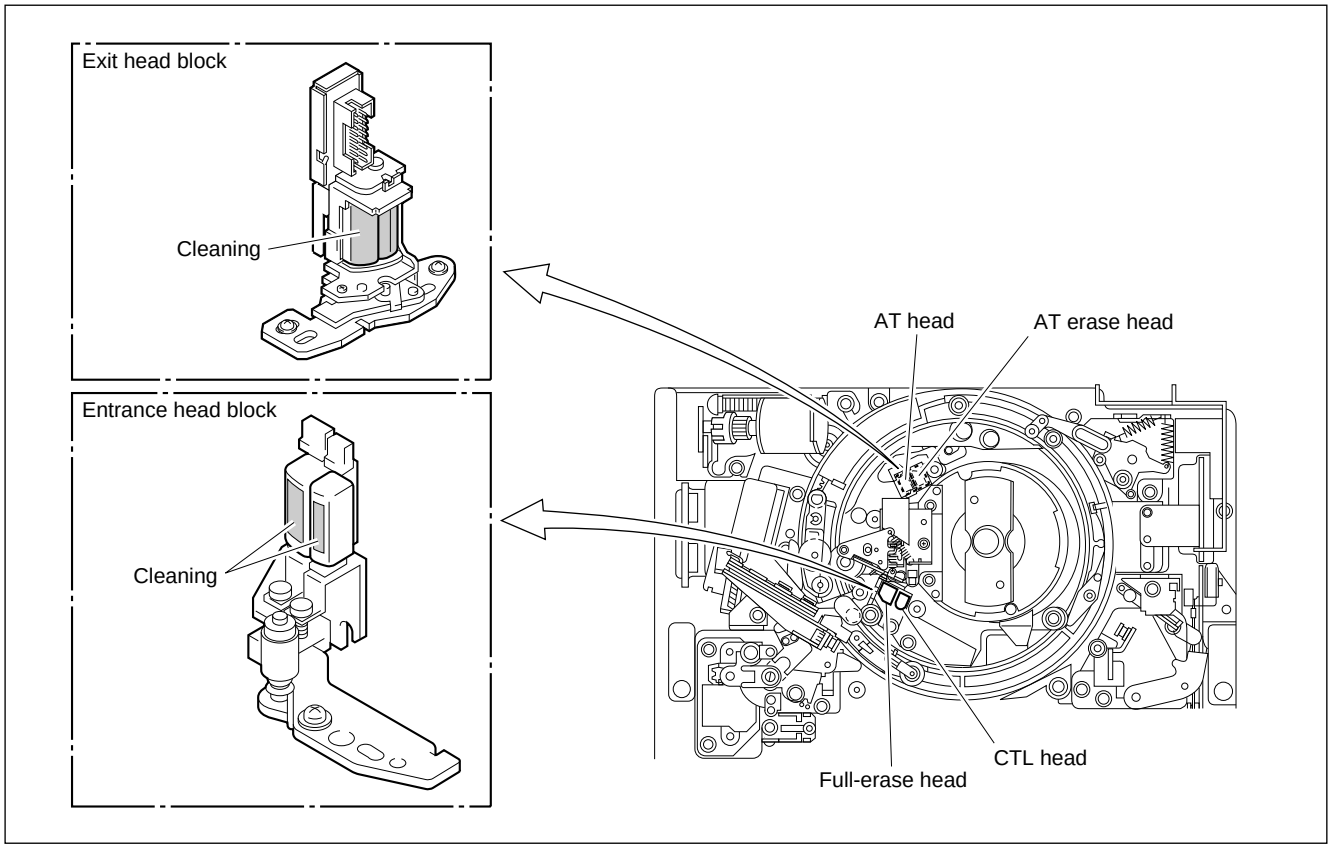
Procedure

1. Clean the tape-running surfaces of the AT, AT erase, CTL, and full-erase heads in the vertical direction using a cleaning cloth moistened with a cleaning fluid.

   Note

   Be sure to remove the magnetic powder completely.
   An error may occur in the recording or playback if magnetic powder attaches to the head gap portion of the AT, AT erase, CTL, and full-erase heads.

2. After cleaning, wipe them using a dry cleaning cloth two or three times.



Stationary Heads Cleaning

2-2-6. Tape Running System and Tape Cleaner Cleaning

WARNING

Keep bare hands away from the sharp edge of the tape cleaner to avoid cuts and injuries.
Pay careful attention when cleaning the tape cleaner.

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Procedure

1. Wipe off the surfaces of the tape cleaner using a paper (such as a sheet of paper of this manual) to remove the magnetic powder adhered on the tape cleaner.

   WARNING

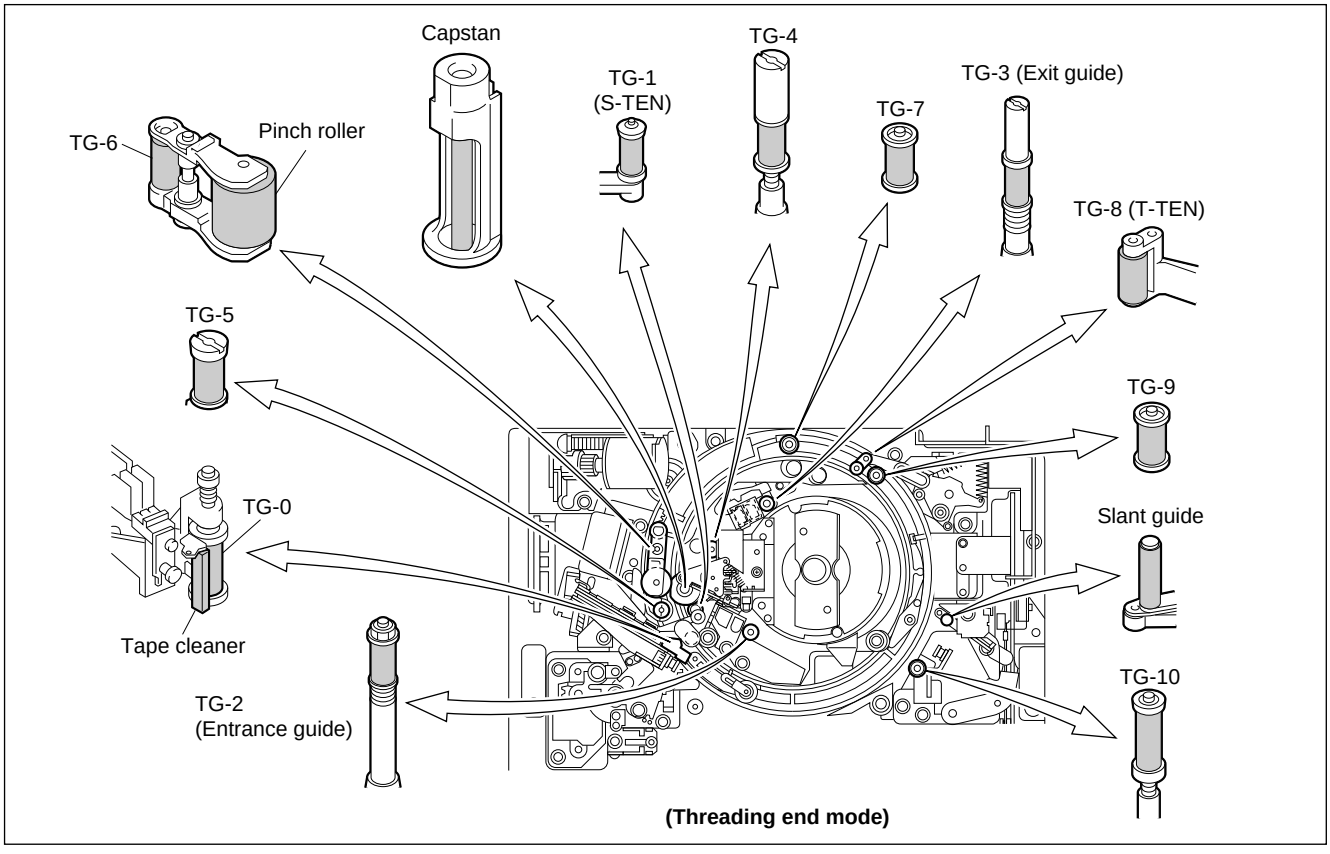
   Do not contact the edge portion of the tape cleaner with bare hands.

   Note

   Do not apply an excessive force to the tape cleaner to avoid damaging it.

2. Clean the tape-running surfaces (shaded portions in the figure) of each guide and the tape cleaner using cleaning cloth moistened with a cleaning fluid.

3. After cleaning, clean them using a dry cleaning cloth two or three times.



Tape-running System and Tape Cleaner Cleaning

2-2-7. Fan Motors Cleaning

Notice

Clean the fan motor on the rear panel often because it accumulates dust easily. The dusty fan motors disturb the air flow through the unit, and a rise in the inside temperature of the unit may badly influence the performance and life of the unit.

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Vacuum cleaner

Procedure

1. Remove the power panel. (Refer to Section 1-3-4.)
   Disconnection of harnesses is not required.

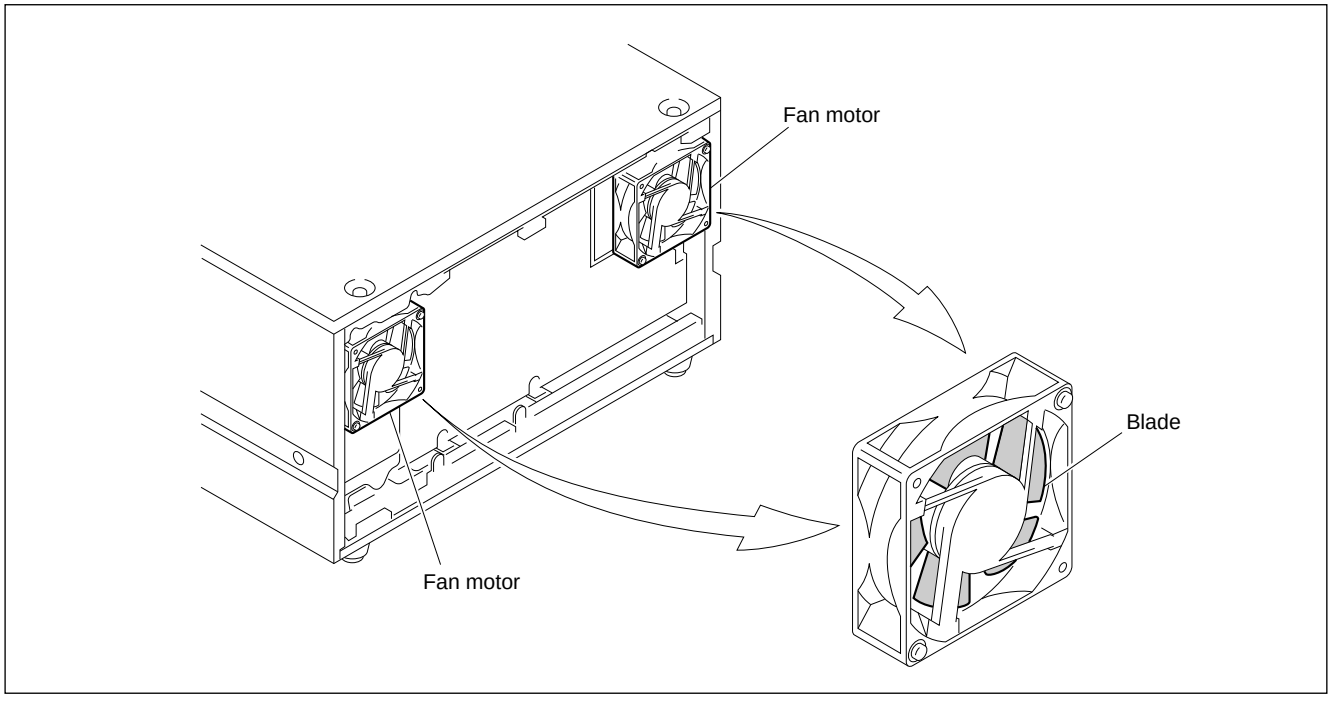
2. Remove the connector panel. (Refer to Section 1-3-3.)
   Disconnection of harnesses is not required.

3. Remove the dust on the fan motors using a vacuum cleaner.

4. Clean the blades of the fan motors (shaded portion in the figure) using cleaning cloth moistened with a cleaning fluid.

5. Reattach the connector panel. (Refer to Section 1-3-3.)

6. Reattach the power panel. (Refer to Section 1-3-4.)



Fan Motors Cleaning

2-2-8. Cassette Compartment and Cassette Supports Cleaning

Notes

- Being careful not to apply an excessive force to the compartment block or mirror, clean the cassette compartment.
- Do not use an alcoholic chemical in cleaning of the door and mirror to avoid cracking them.

Tools

- Cloth (or Gauze)
- Vacuum cleaner

Procedure

1. Remove the cassette compartment from the unit. (Refer to Section 1-5.)

2. Remove the dust on the cassette compartment from the cassette insertion inlet using a vacuum cleaner.

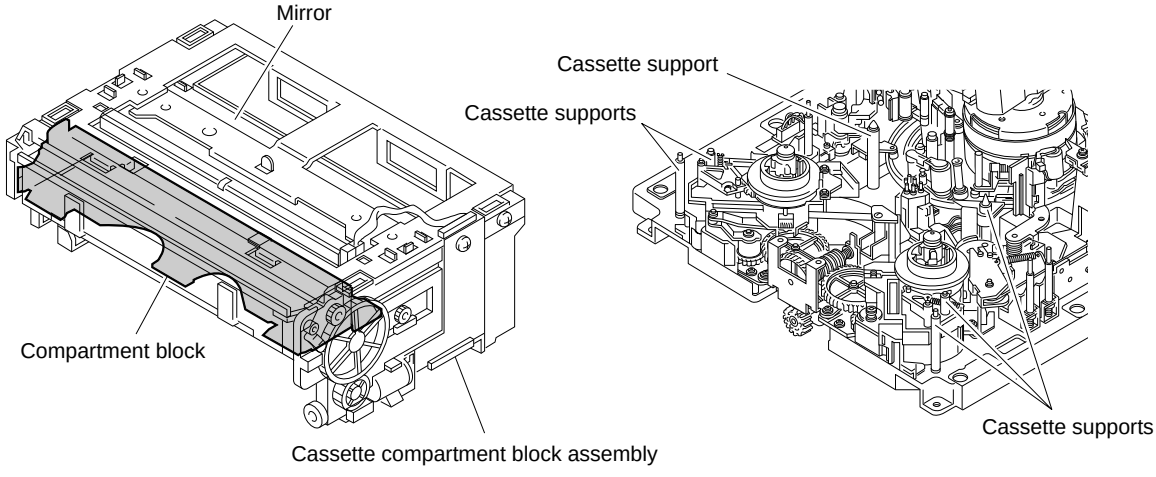
3. Clean the compartment (shaded portion in the figure) using a dry cloth (or gauze).

   Note

   Do not apply an excessive force to the compartment block.

4. Clean the cassette supports on the mechanical deck using a dry cloth (or gauze).

5. Reattach the cassette compartment. (Refer to Section 1-5.)



Cassette Compartment Cleaning

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2-3. Video Head Tip Protrusion Check

When performing the periodic maintenance or inspection, measure the tip protrusion of the video heads using a head tip protrusion measurement gauge to check them for the upper drum assembly replacement.

If the tip protrusion of all heads are satisfying the following specification and more, it enables to recording and playing back on the tape.

Head	Specification
PB heads for BetacamSX format	22 µm
REC heads for BetacamSX format	24 µm

If the tip protursion of any one head is under the specitication, it is recommended that the upper drum assembly should be replaced early before occurring the trouble at the recording or playing back.
For the upper drum replacement, refer to Section 5-2.

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-537-01
- Head tip protrusion measurement gauge: J-6530-650-A
- Torque screwdriver (6 kg•cm) (JB-5251): J-6252-510-A
- Torque screwdriver's bit (+2 mm, l = 75 mm): J-6323-420-A

2-3-1. Head Tip Protrusion Measurement

Preparations for VTR

1. Remove the top plate. (Refer to Section 1-3-1.)
2. Remove the plate MD assembly. (Refer to Section 1-4.)
3. Remove the cassette compatment. (Refer to Section 1-5.)
4. Remove the brush slip ring assembly. (Refer to Section 2-3-2.)
5. Clean the outer circumference and video heads of the upper drum (shaded portions in Figure 1). (Refer to Section 2-2-3 for the cleaning method.)

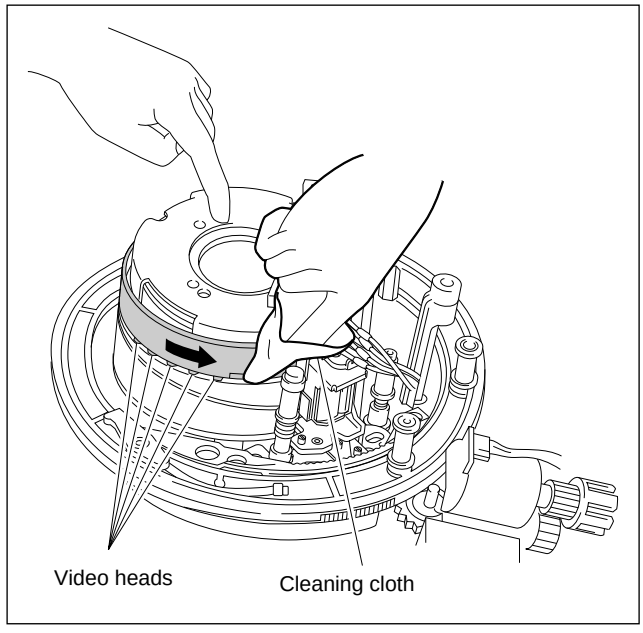


Figure 1. Cleaning of Drum

Preparations for Head Tip Protrusion Measurement Gauge

This gauge is the precision equipment. Handle with care.

1. Loosen the adjustment screw fully (by turning it counterclockwise).
2. Clean the probe, positioning flange, and portion touching the drum of two legs. (Refer to Figure 3.)

Note

Do not apply excessive force to the probe during cleaning. If a deposit of µm order exists, measurement cannot be performed accurately.

Setting of Head Tip Protrusion Measurement Gauge

Note

Being careful not to damage the tape-running surface and video heads of the drum, set the gauge.

1. Turn the upper drum manually counterclockwise (↺) to align the screw hole ("⇨" mark on the board cover) to the rib of the threading ring as shown in Figure 2.

Note

The upper drum position is determined as described above to put the probe of the head tip protrusion measurement gauge on the absence of a head. The video head that first measures the protrusion value is the CNF A head.

2. Check the value that the dial gauge pointer reads.
3. Position a probe between the ADV B2 head and CNF A head. (Refer to Figure 2.)
4. Press the tip of two legs against the outer circumference of the drum's upper surface while keeping the base plate of the measurement gauge in parallel with the upper surface of the drum. Be sure to keep the probe of the measurement gauge sufficiently away from the drum.
5. Lower the measurement gauge slowly until the ridges of the two legs and positioning flange touch the upper drum while pushing two legs against the outer circumference of the drum's upper surface (applying force slightly to the measurement gauge in the direction indicated by the arrow). (Refer to Figure 3.)

   Notes

   - Before placing a measurement gauge on the drum, ensure that the adjustment screw has been loosened fully.
   - Perform carefully and slowly so that the probe of a measurement gauge does not touch the outer circumference or video head on the drum.
     (Lower so that the probe is slightly higher than the two legs.)
6. Check to see the followings:
   - The probe is in the middle of the adjacent heads.
   - The positioning flange adheres closely to the outer circumference of the drum's upper surface.
   - The legs adhere closely to the outer circumference of the drum's upper surface.
   - The value that the dial gauge pointer reads is the same as before setting (in step 2).
7. Turn the adjustment screw clockwise until the dial gauge pointer rotates approximately a half turn.
8. Turn the outer circumference of the dial gauge to align zero (0) to the pointer.

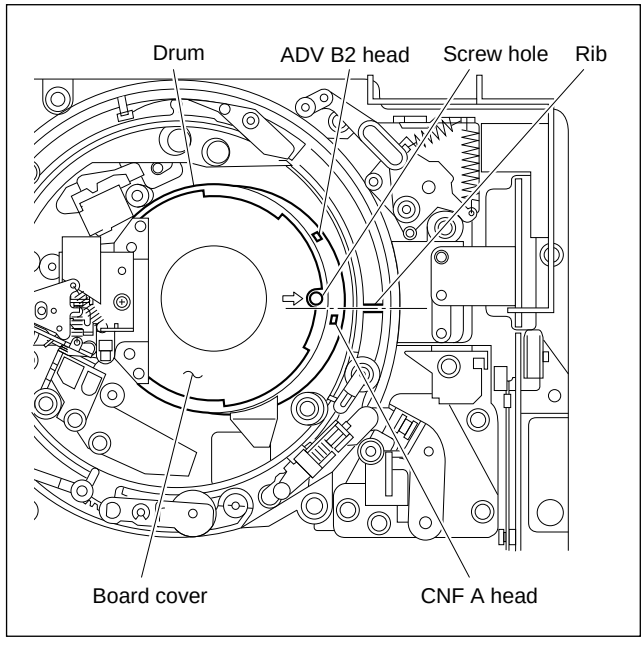


Figure 2. Setting of Drum Position

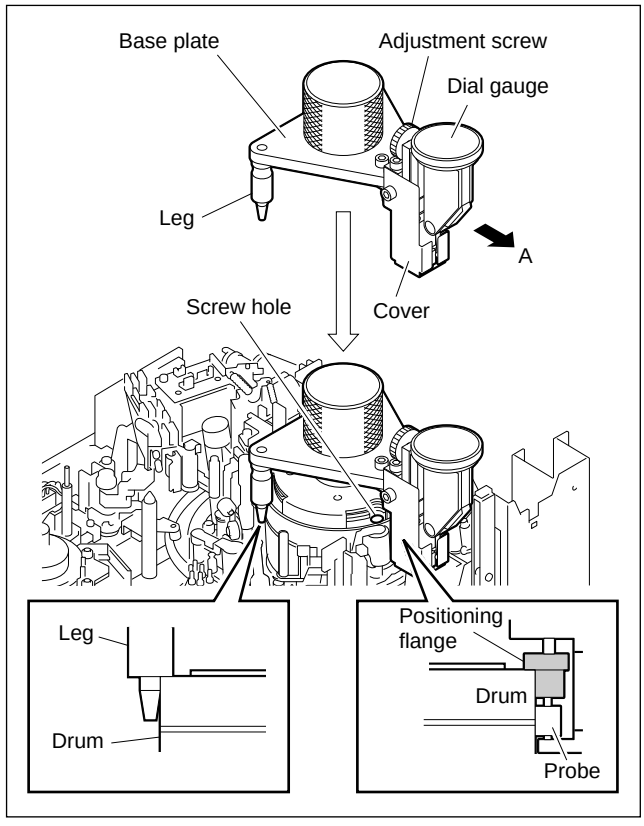


Figure 3. Setting of Head Tip Protrusion Measurement Gauge

Measurement of Head Tip Protrusion

Note

When turning the upper drum manually, hold the cover of the measurement gauge by your hand to not come to turn the gauge with the drum rotation.

1. Turn the upper drum manually counterclockwise (↺) very slowly to approach a video head aside of the probe. (Refer to <A> in Figure 4.)
2. Read the dial gauge pointer. (= Ha)
   Note
   The scale of the dial gauge is 2 µm (0.002 mm) pitch. Clockwise: +. Counterclockwise: −.
3. Turn the upper drum manually counterclockwise (↺) very slowly to center the video head in the probe. (Refer to <B> in Figure 4.)
4. Read the dial gauge pointer. (= Hb)
5. Calculate the real head tip protrusion Hr with the Ha and Hb.
   Hr = Hb − Ha
6. Calculate the head tip protrusion Hr for all heads with steps 1 through 5 performing .
7. Measure and calculate the real head tip protrusion Hr for all heads again.
   Note
   Do it two times for fear of measuring error.

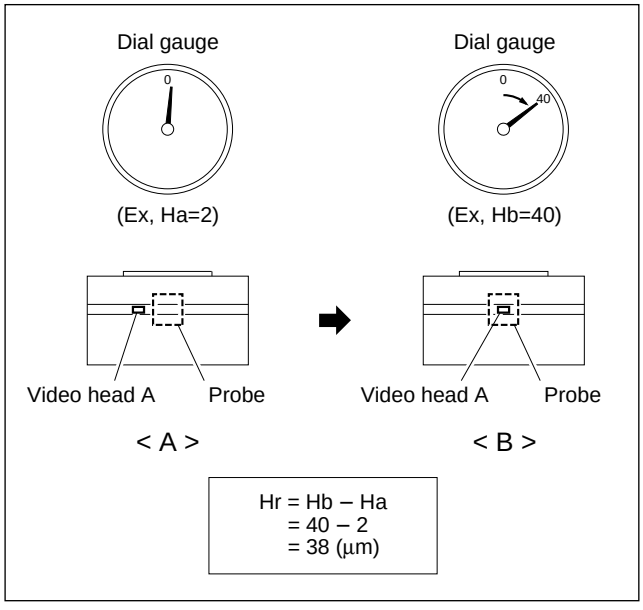


Figure 4. Example of Head Tip Protrusion Measurement

This table is in measure order of the heads.

Head name	Spec. (µm)	Head tip protrusion (Hr = Hb − Ha) First time	Second time
CNF A	22	= − |	= −
CNF B	22	= − |	= −
Dummy	−	(No need for measurement)	
ADV A5	22	= − |	= −
ADV B5	22	= − |	= −
ADV A6	22	= − |	= −
ADV B6	22	= − |	= −
Erase	−	(No need for measurement)	
REC A	24	= − |	= −
REC B	24	= − |	= −
Dummy	−	(No need for measurement)	
ADV A1	22	= − |	= −
ADV B1	22	= − |	= −
ADV A2	22	= − |	= −
ADV B2	22	= − |	= −

Removal of Head Tip Protrusion Measurement Gauge

1. Turn the upper drum manually counterclockwise (↺) very slowly to move a video head aside from the probe.
2. Loosen the adjustment screw fully (by turning it counterclockwise).
3. Lift up the positioning flange from the outer circumference of the drum's upper surface to a few millimeters, and then lift the measurement gauge slowly and remove it while pushing two legs against the outer circumference of the drum's upper surface (applying force slightly to the measurement gauge in the direction indicated by arrow A). (Refer to Figure 3.)
   Note
   Perform carefully and slowly so that the probe of a measurement gauge does not touch the outer circumference or video head on the drum.

2-3-2. Brush Slip Ring Assembly Removal/Reinstallation

Preparing tools

- Torque screwdriver (6 kg•cm) (JB-5251): J-6252-510-A
- Torque screwdriver's bit (+2 mm, l = 75 mm): J-6323-420-A

Note

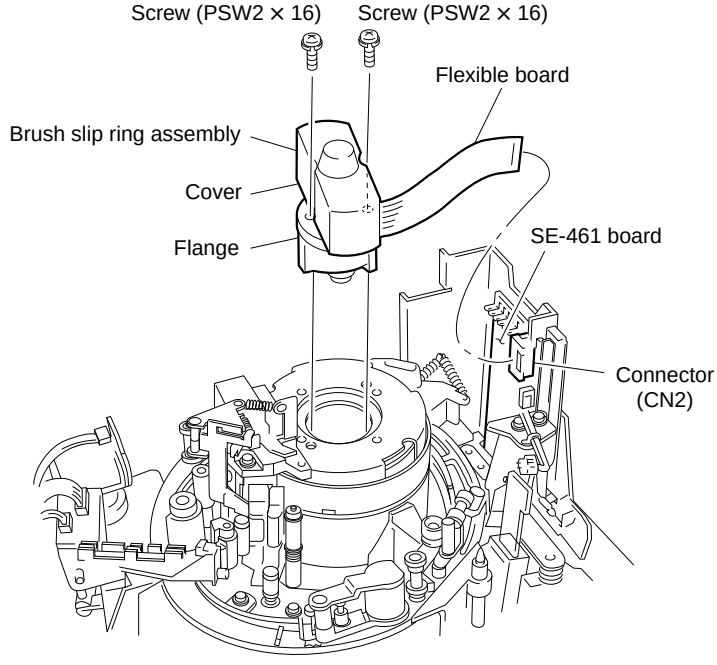
If replacing the brush slip ring assembly, refer to Section 5-4.

Removal

1. Unlock the connector CN2, then disconnect the flexible board from the connector CN2 on the SE-461 board.
   Note
   To unlock the connector CN2, pull the slider (white) of the connector.
2. Unscrew the two screws to remove the brush slip ring assembly.
   Note
   Do not apply any force forcibly to the brush slip ring assembly.
3. To take out the screws, turn the brush slip ring assembly upside down.
   Note
   Be careful not to drop these screws in the cover.

Reinstallation

4. Insert the two screws removed in step 2 into the screw holes of the brush slip ring assembly.
5. Reinstall the brush slip ring assembly in the direction shown in the figure.
6. Tighten the two screws alternately and gradually while pushing both sides of the flange uniformly.
   Tightening torque: 14.7×10^{-2} N•m {1.5 kgf•cm}
7. Insert the flexible board into the connector CN2 on the SE-461 board, then lock the connector.
   Notes
   - Be sure to insert the flexible board into the connector CN2 with unlocked.
     (Refer to **Note** on step 1 for "Unlock".)
   - To lock the connector CN2, press in the slider (white) of the connector.

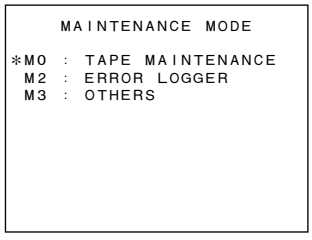


Tightening torque: 14.7×10^{-2} N•m {1.5 kgf•cm}

Section 3
Maintenance Mode

3-1. Overview of Maintenance Mode

This unit has the maintenance mode that is useful during maintenance and trouble diagnosis.
This maintenance mode consists of the three modes below. The contents of the maintenance mode are superimposed on the video monitor connected to the VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
(To superimpose the contents of the maintenance mode, set the CHARACTER switch on the sub control panel to ON.)

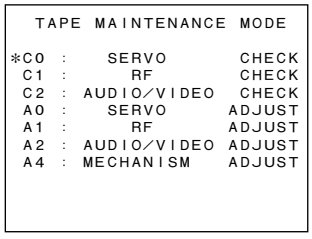


Note
The typeface of characters displayed on the video monitor differs from the actual one.

(Mode screen during activation of maintenance mode)

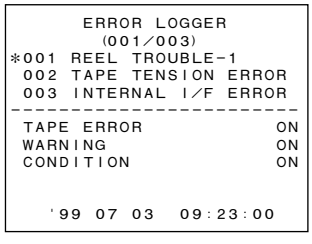
M0 : TAPE MAINTENANCE ..... (Section 3-2)

This mode is used for maintenance of a VTR part.



M2 : ERROR LOGGER ..... (Section 3-3)

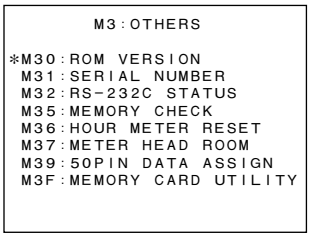
This mode is used to display the record of errors (error logging) that occur in this unit.



Note
The display on the left is one of the displayed examples.

M3 : OTHERS ..... (Section 3-4)

This mode is used for checking the others.



Buttons and Switches for Operation

The main buttons and switches related to the operation of maintenance mode are as follows: The ordinary functions of these buttons and switches and how to use them are described below.

① Time data display area
The time data display area displays the menu (mode) No., menu title, selection item, status, or data. The menu (mode) No. or selection item block blinks while the menu (mode) or selection item is specified (not including the servo menu in the TAPE maintenance mode). For manual adjustment, the data block blinks. In the state where the tape operation (PB, REC, F FWD, and REW) can be performed, the time data display area functions as an ordinary time counter.
There is a menu (mode) that contains insufficient information displayed in the time data display area. Since the information displayed on the superimpose picture is easier to operate and check, usually use a video monitor.

② MENU button
Press this button in the maintenance mode to return to the screen (state) preceding by one step.
The maintenance mode is terminated if this button is pressed when the mode screen is displayed (mode No. M0, M2, or M3 blinks in a time data display area).

③ SET button
Press this button in the maintenance mode to select or execute the menu (mode) selected using a ⑧ search dial.
The maintenance mode can be activated when this SET button is pressed while pressing the ④ CTL/TC/UB button in the setup menu mode with ⑩ DIP switch S1100-2 on the SS-83 board set to ON (upper).

④ CTL/TC/UB button
The maintenance mode can be activated when the ③ SET button is pressed while pressing this button in the setup menu mode with ⑩ DIP switch S1100-2 on the SS-83 board set to ON (upper).

⑤ RESET button
Press this button in the error logger mode to erase the recorded error log.

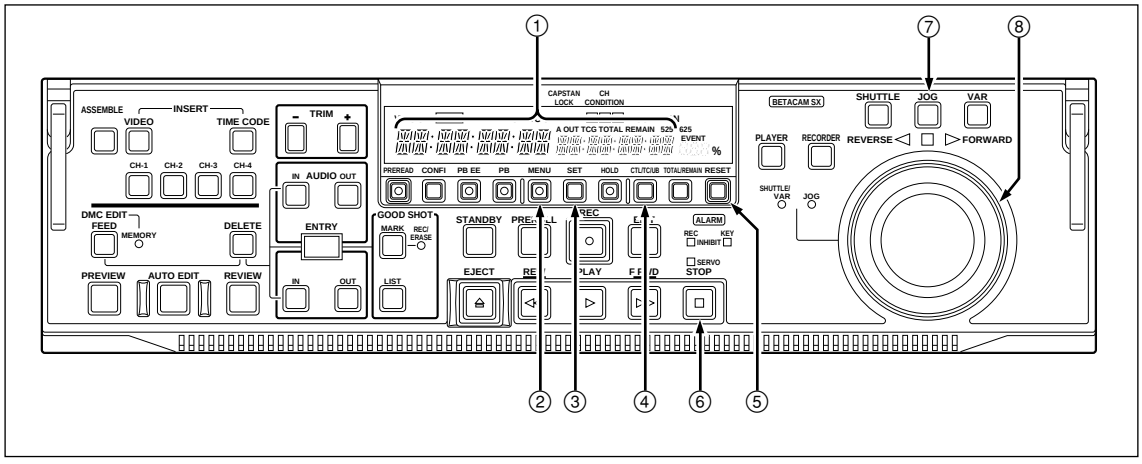
⑥ STOP button
The data value of an electronic volume control can be displayed only while the STOP button is pressed in RF system automatic adjustment menu.

⑦ JOG button
The ⑧ search dial enters the JOG mode when this button is pressed (the lamp does not light in this case). The data value or setting can be changed when the ⑧ search dial is turned while pressing this button.

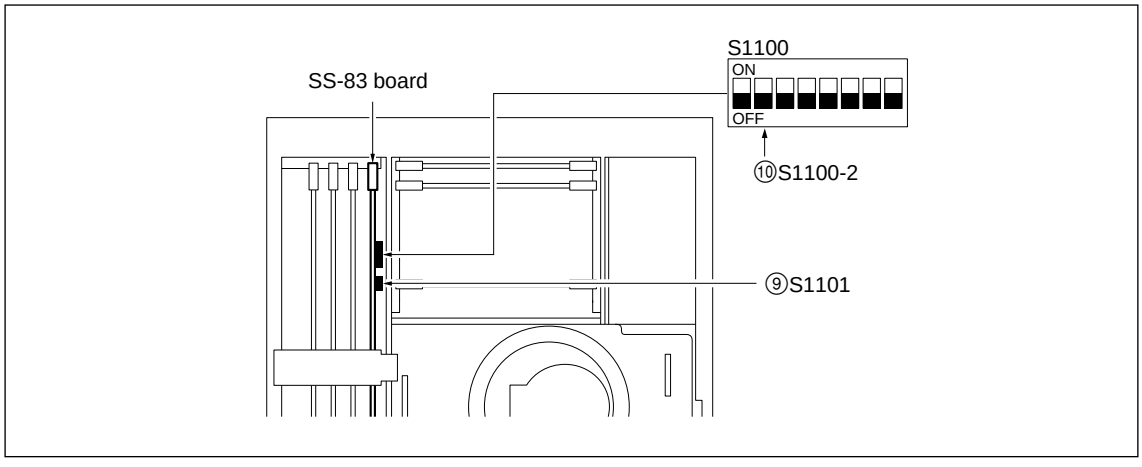
⑧ Search dial
Turn the search dial to specify the menu (mode) or selection item. An "*" mark moves on the video monitor. In a time data display area, the display is replaced and the specified item blinks. ("JOG DIAL" is displayed on the video monitor.)
The data value or setting can be changed when the search dial is turned while pressing the ⑦ JOG button.

⑨ S1101/SS-83 board: Maintenance mode start switch (MAINTE MODE START)
Press this switch to activate the maintenance mode.

⑩ S1100-2/SS-83 board: Maintenance mode access approval switch (MAINTE MODE Access)
Set this switch to ON (upper) in advance when activating the maintenance mode by the button operation on the control panel.



Lower Control Panel



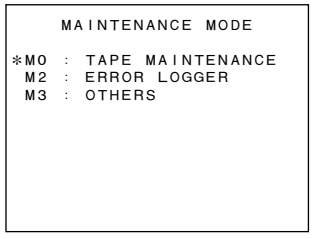
Location of Switches on SS-83 Board

Note

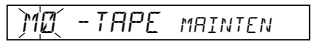
Remove the upper lid referring to Section 1-3-1 when operating the switches on the SS-83 board. Change the setting of DIP switch S1100 with the power switch set to OFF.

Activating the Maintenance Mode

(1) Confirm that the video monitor is connected to the VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
(2) Press the ⑨ S1101 switch (on the SS-83 board).
(3) The mode screen in the maintenance mode is superimposed on the video monitor.
In a ① time data display area, “M0-TAPE MAINTEN” is displayed and the M0 block blinks.



Video Monitor



Time Data Display Area

Activating the Maintenance Mode from Control Panel

The maintenance mode can be activated by the operation below when the S1100-2 switch (on the SS-83 board) is set to ON (upper).

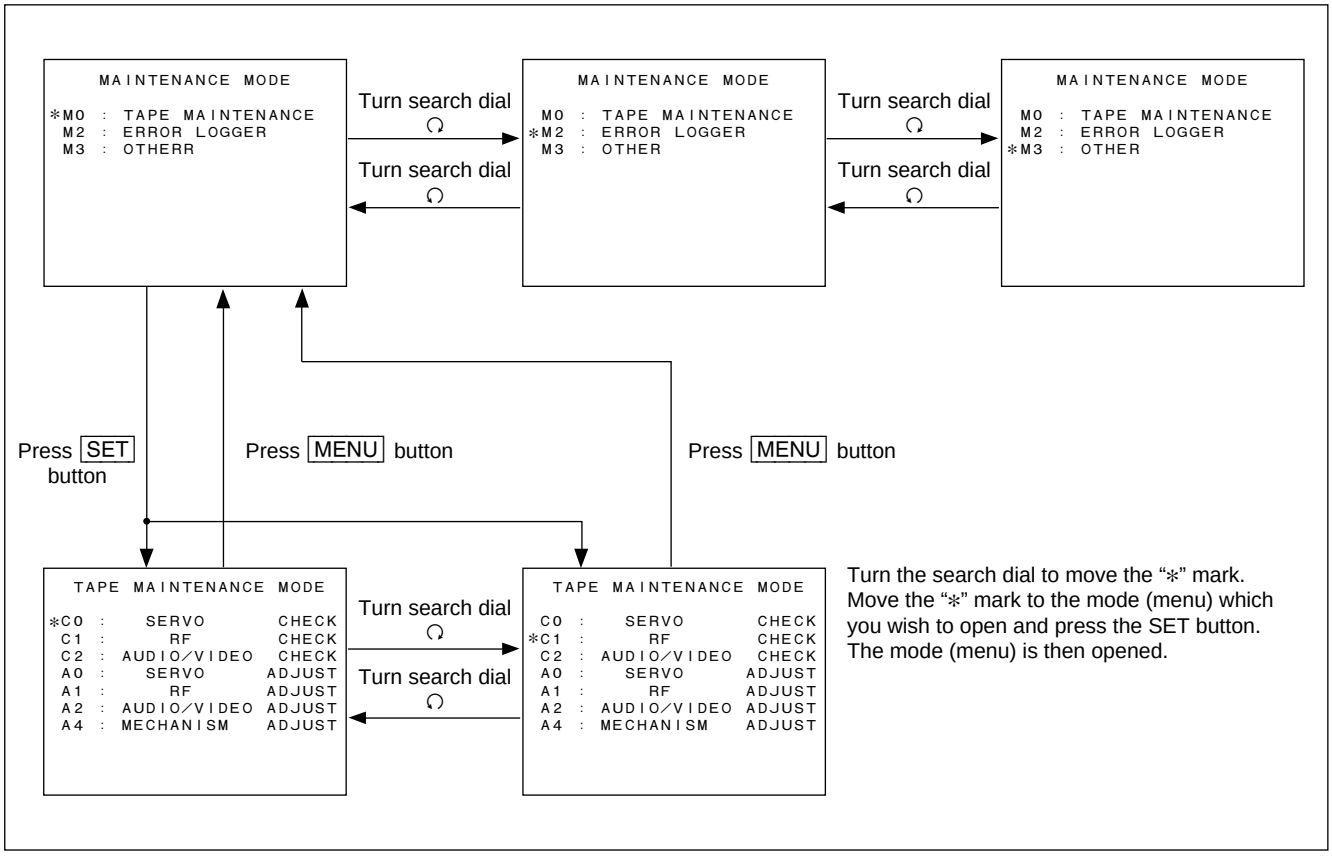
(1) Press the ② MENU button once.
(Execute the setup menu mode from the operation mode.)
(2) Press the ③ SET button while pressing the ④ CTL/TC/UB button.
(Execute the maintenance mode from the setup menu mode.)
(3) The mode screen in the maintenance mode is displayed on the video monitor.

Terminating the Maintenance Mode

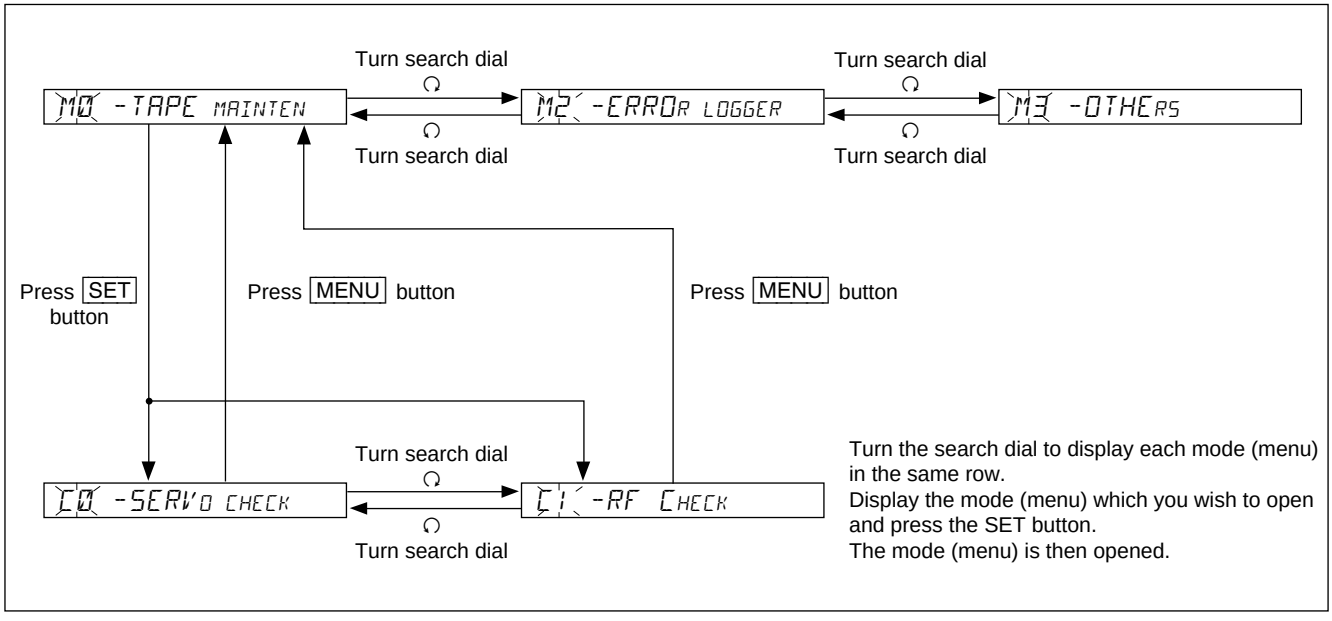
(1) Press the ② MENU button several times to display the mode screen on the video monitor.
The selected mode No. and title are displayed in a time counter.
(2) Press the ② MENU button again to terminate the maintenance mode.

Specifying the Menu (Mode) and Item

How to specify the menu (mode) and item using the search dial (JOG mode) is described below with the mode selection given as an example.


MAINTENANCE MODE
*M0 : TAPE MAINTENANCE
M2 : ERROR LOGGER
M3 : OTHERR
Turn search dial
Turn search dial
MAINTENANCE MODE
M0 : TAPE MAINTENANCE
*M2 : ERROR LOGGER
M3 : OTHER
Turn search dial
Turn search dial
MAINTENANCE MODE
M0 : TAPE MAINTENANCE
M2 : ERROR LOGGER
*M3 : OTHER
Press SET button
Press MENU button
Press MENU button
TAPE MAINTENANCE MODE
*C0 : SERVO CHECK
C1 : RF CHECK
C2 : AUDIO/VIDEO CHECK
A0 : SERVO ADJUST
A1 : RF ADJUST
A2 : AUDIO/VIDEO ADJUST
A4 : MECHANISM ADJUST
Turn search dial
Turn search dial
TAPE MAINTENANCE MODE
C0 : SERVO CHECK
*C1 : RF CHECK
C2 : AUDIO/VIDEO CHECK
A0 : SERVO ADJUST
A1 : RF ADJUST
A2 : AUDIO/VIDEO ADJUST
A4 : MECHANISM ADJUST
Turn the search dial to move the "*" mark.
Move the "*" mark to the mode (menu) which you wish to open and press the SET button.
The mode (menu) is then opened.

Example in Superimpose Picture

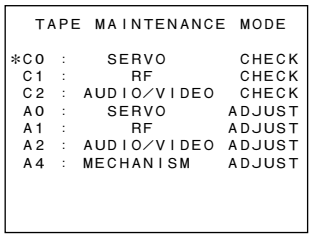

M0 -TAPE MAINTEN
Turn search dial
Turn search dial
M2 -ERROR LOGGER
Turn search dial
Turn search dial
M3 -OTHERS
Press SET button
Press MENU button
Press MENU button
C0 -SERVO CHECK
Turn search dial
Turn search dial
C1 -RF CHECK
Turn the search dial to display each mode (menu) in the same row.
Display the mode (menu) which you wish to open and press the SET button.
The mode (menu) is then opened.

Example in Time Data Display Area

3-2. TAPE Maintenance Mode (M0)

3-2-1. Overviews

The TAPE maintenance mode is used for the maintenance and check.
This unit has the seven submodes below.



TAPE Maintenance Mode

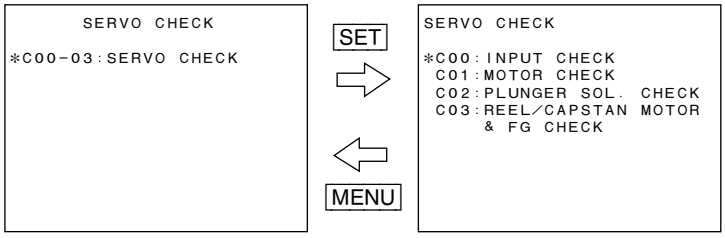
http://getMANUAL.com

C0: SERVO CHECK

This submode is used to check the servo system.

C00-03: SERVO CHECK

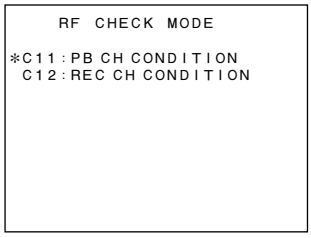
This mode is used to check the servo system. For more details, refer to Section 3-2-2 (on page 3-12).



Title		Page	Description
C00 :	INPUT CHECK	—	Check menu of sensors (not including a part of sensors)
	C000 : CASSETTE SW	3-13	Checks the cassette tab and REC inhibit sensors.
	C001 : CASSETTE COMP. SW	3-14	Checks the cassette-in and cassette size sensors.
	C002 : TOP/END SENSOR	3-15	Checks the tape top and tape end sensors.
	C003 : DEW SENSOR	3-16	Checks the dew condensation sensors.
C01 :	MOTOR CHECK	—	Check menu of motors (except a fan motor) and partial sensors
	C010 : S REEL MOTOR	3-17	Checks the S reel motor.
	C011 : T REEL MOTOR	3-17	Checks the T reel motor.
	C012 : THREADING MOTOR	3-18	Checks the threading motor and threading/unthreading end sensors.
	C013 : CASSETTE COMP. MOTOR	3-20	Checks the cassette compartment motor and cassette-down sensors.
	C014 : CAPSTAN MOTOR	3-22	Automatically checks the capstan motor.
	C015 : DRUM MOTOR	3-23	Automatically checks the drum motor.
	C016 : REEL POSITION MOTOR	3-24	Checks the reel shift motor and reel position sensors.
C02 :	PLUNGER SOL. CHECK	—	Check menu of solenoids
	C020 : PINCH ROLLER	3-25	Checks the pinch roller solenoid.
	C021 : S REEL BRAKE	3-26	Checks the S reel brake solenoid.
	C022 : T REEL BRAKE	3-26	Checks the T reel brake solenoid.
	C023 : CLEANING ROLLER	3-27	Checks the cleaning roller solenoid.
C03 :	REEL/CAPSTAN MOTOR & FG CHECK	3-28	Continuous check menu of reel and capstan motors

C1 : RF CHECK

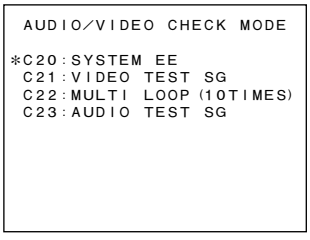
This submode is used to check the RF system.
For more details, refer to Section 3-2-3 (on page 3-29).



Title	Page	Description
C11 : PB CH CONDITION	3-29	Checks the error condition for each PB head (A1, A2, A5, A6, B1, B2, B5, B6, CNFA, and CNFB) in a drum.
C12 : REC CH CONDITION	3-34	Checks the error condition in the insert mode for each PB head (A1, A5, B1, B5, CNFA, and CNFB) in a drum.

C2 : AUDIO/VIDEO CHECK

This submode is used to check the audio and video systems.
For more details, refer to Section 3-2-4 (on page 3-38).



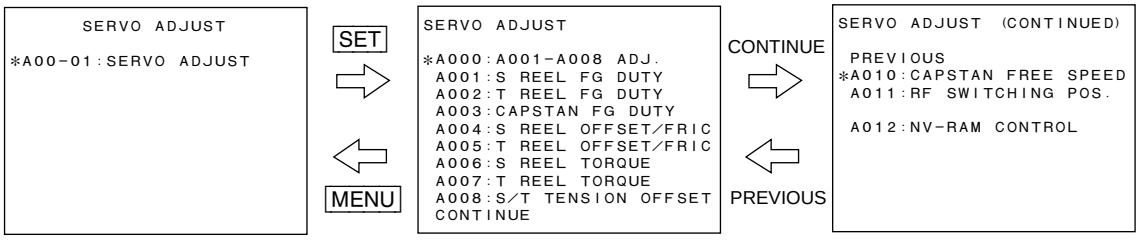
Title	Page	Description
C20 : SYSTEM EE	3-38	Sets the system E-E function in the maintenance mode.
C21 : VIDEO TEST SG	3-38	Sets the video test signal generator incorporated into this unit.
C22 : MULTI LOOP (10 TIMES)	3-39	Sets the multi-loop function in the maintenance mode.
C23 : AUDIO TEST SG	3-39	Sets the audio test signal generator incorporated into this unit.

A0: SERVO/DT ADJUST

This submode is used to adjust the servo system.

A00-01: SERVO ADJUST

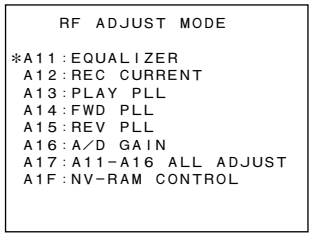
This mode is used to adjust the servo system. For more details, refer to Section 3-2-5 (on page 3-40).



Title	Page	Description
A000 : A001-A008 ADJ.	3-41	Continuously executes the automatic adjustment menus (A001 to A008).
A001 : S REEL FG DUTY	3-42	Automatically adjusts the duty ratio of an S reel FG.
A002 : T REEL FG DUTY	3-42	Automatically adjusts the duty ratio of a T reel FG.
A003 : CAPSTAN FG DUTY	3-42	Automatically adjusts the duty ratio of a capstan FG.
A004 : S REEL OFFSET/FRIC	3-42	Automatically adjusts the S reel offset and friction.
A005 : T REEL OFFSET/FRIC	3-42	Automatically adjusts the T reel offset and friction.
A006 : S REEL TORQUE	3-42	Automatically adjusts the S reel torque.
A007 : T REEL TORQUE	3-42	Automatically adjusts the T reel torque.
A008 : S/T TENSION OFFSET	3-42	Automatically adjusts the tension regulator offset values on the S and T sides.
A010 : CAPSTAN FREE SPEED	3-43	Automatically adjusts the capstan free speed.
A011 : RF SWITCHING POS.	3-44	Automatically adjusts the RF switching position.
A012 : NV-RAM CONTROL	3-46	Saves the adjustment data in a servo system.

A1 : RF ADJUST

This submode is used to adjust the RF system.
For more details, refer to Section 3-2-6 (on page 3-47).



Title	Page	Description
A11 : EQUALIZER	3-48	Automatically adjusts the PB head playing back level and PB equalizer (for A1, A2, A5, A6, B1, B2, B5, B6, CNFA, and CNFB channels).
A12 : REC CURRENT	3-48	Automatically adjusts the recording current.
A13 : PLAY PLL	3-48	Automatically adjusts the PB PLL circuit (in the PLAY mode).
A14 : FWD PLL	3-48	Automatically adjusts the PB PLL circuit (in the FORWARD mode).
A15 : REV PLL	3-48	Automatically adjusts the PB PLL circuit (in the REVERSE mode).
A16 : A/D GAIN	3-48	Automatically adjusts the gain when a PB RF signal is converted from analog to digital.
A17 : A11-A16 ALL ADJUST	3-52	Continuously executes the above automatic adjustment menus A11 to A16.
A1F : NV-RAM CONTROL	3-54	Saves the adjustment data in an RF system.

A2 : AUDIO/VIDEO ADJUST

This submode is used to adjust the audio and video systems.
For more details, refer to Section 3-2-7 (on page 3-55).

```
AUDIO/VIDEO ADJUST MODE

*A20:VPR VR
 A21:AD VR
 A22:AD VR (LOOP)
 A23:SDI VR
 A24:INPUT CF DETECT
 A25:DEC VR
 A26:DEC VR (LOOP)
 A2F:NV-RAM CONTROL
```

Title	Page	Description
A20 : VPR VR	3-56	Adjusts the reference signal system and analog video output system on the VPR-47 board.
A21 : AD VR	3-57	Adjusts the analog component video input system.
A22 : AD VR (LOOP)	3-57	Adjusts the analog component video input system (in the multi-loop state).
A23 : SDI VR	3-58	Adjustment menu for the SDI and SDTI input/output interfaces
A231 : SDI ENC1 VCO	3-58	Automatically adjusts the SDI output interface.
A232 : SDI ENC2 VCO	3-58	Automatically adjusts the SDI output interface.
A233 : SDI DEC VCO	3-58	Automatically adjusts the SDI input interface.
A234 : SDTI ENC VCO	3-58	Automatically adjusts the SDTI output interface. (Used for BKNW-118.)
A235 : SDTI DEC VCO	3-58	Automatically adjusts the SDTI input interface. (Used for BKNW-117.)
A24 : INPUT CF DETECT	3-60	Automatically adjusts the color frame detection timing of a composite video input.
A25 : DEC VR	3-62	Adjusts the composite video input system.
A26 : DEC VR (LOOP)	3-62	Adjusts the composite video input (in the multi-loop state).
A2F : NV-RAM CONTROL	3-63	Saves the adjustment data in audio and video systems.

A4 : MECHANISM ADJUST

This submode is used to adjust the mechanism part.
For more details, refer to Section 3-2-8 (on page 3-64).

```
    MECHANISM ADJUST

*A40:PATH MODE SEL
```

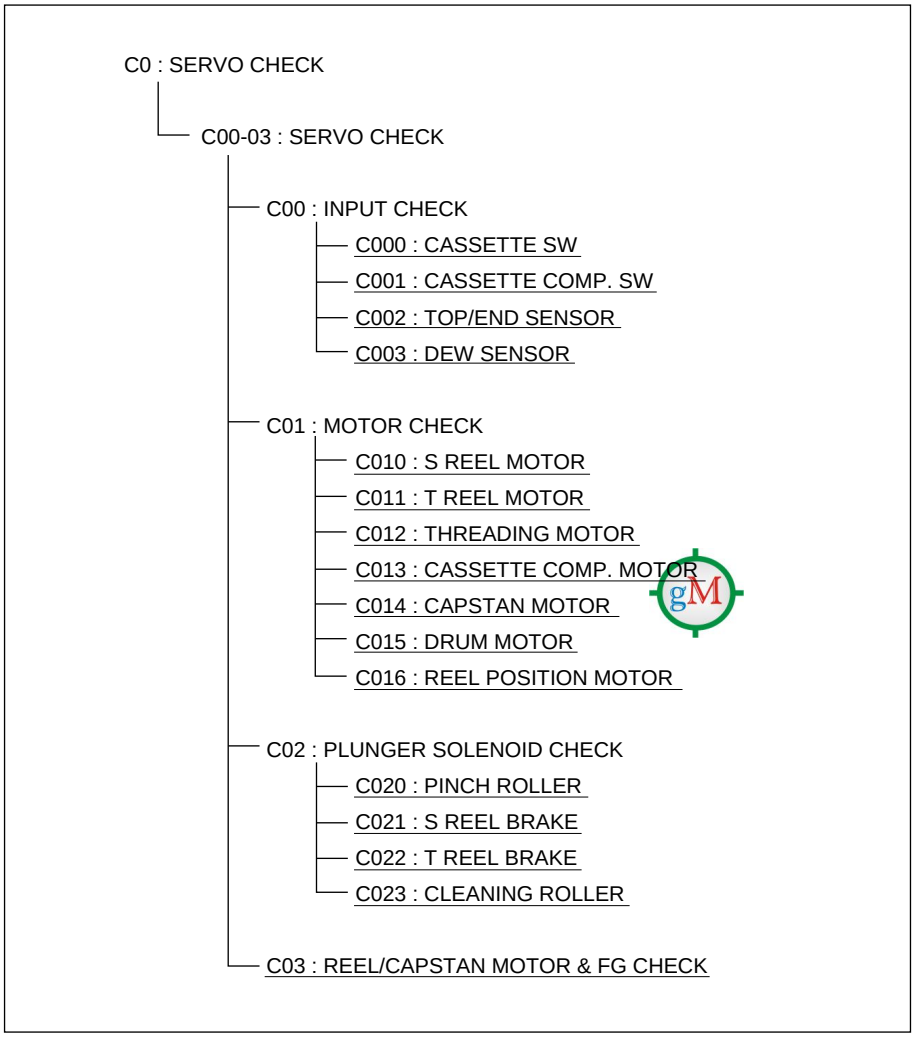
Title	Page	Description
A40 : PATH MODE SEL	3-64	Sets the tape PB mode. (Used for tape transport adjustment.)

3-2-2. SERVO CHECK Mode (C00-03)

The C00-03 : SERVO CHECK mode is used to check the servo system. The underlined menus and submenus in the menu tree below are described next.

Note

In the servo check mode, only the menu number is displayed in a time data display area. (C00-03 is displayed as “C00”.)


C0 : SERVO CHECK
C00-03 : SERVO CHECK
C00 : INPUT CHECK
C000 : CASSETTE SW
C001 : CASSETTE COMP. SW
C002 : TOP/END SENSOR
C003 : DEW SENSOR
C01 : MOTOR CHECK
C010 : S REEL MOTOR
C011 : T REEL MOTOR
C012 : THREADING MOTOR
C013 : CASSETTE COMP. MOTOR
C014 : CAPSTAN MOTOR
C015 : DRUM MOTOR
C016 : REEL POSITION MOTOR
C02 : PLUNGER SOLENOID CHECK
C020 : PINCH ROLLER
C021 : S REEL BRAKE
C022 : T REEL BRAKE
C023 : CLEANING ROLLER
C03 : REEL/CAPSTAN MOTOR & FG CHECK

Menu Tree of Servo System Check Mode

Note

A cassette tape is automatically ejected if it has been inserted into this unit when the C00-03 : SERVO CHECK screen is shifted to the lower-level menu.

C000 : CASSETTE SW

This submenu checks the functions of cassette tab sensors and REC inhibit sensors (switches).

```
SERVO CHECK
 INPUT CHECK

C000:CASSETTE SW
 1:REEL HUB   2:METAL/OX
 3:THICKNESS  4:SPARE
 5:SPARE      6:DGTL/ANLG
 7:S REC INH  8:L REC INH
 9:L SP INH
                  7  123  9
 SW 987654321        4 5  8
    000000000         6
```

(1) Push each sensor (switch) with fingers.
- Confirm that “0” below the corresponding switch number changes to “1”.

(2) Release the fingers.
- Confirm that “1” below the corresponding switch number returns to “0”.

(Ex.: When pushing the switch ⑦)

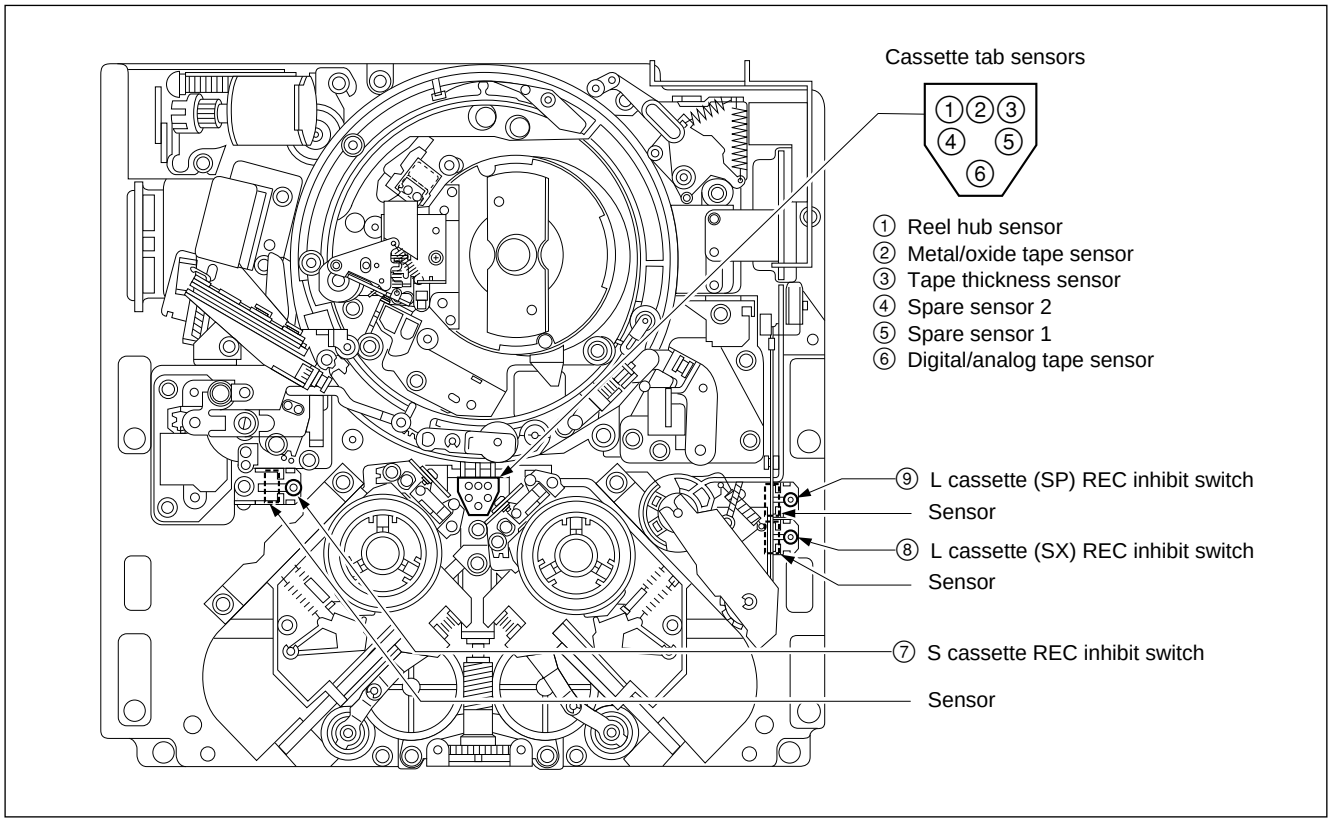
```
SERVO CHECK
 INPUT CHECK

C000:CASSETTE SW
 1:REEL HUB   2:METAL/OX
 3:THICKNESS  4:SPARE
 5:SPARE      6:DGTL/ANLG
 7:S REC INH  8:L REC INH
 9:L SP INH
                  7  123  9
 SW 987654321        4 5  8
    001000000         6
```

(3) Press the MENU button when terminating the check.

In case of NG

When cassette tab sensors (① to ⑥) are NG
- Check the corresponding sensor on the PTC-59 board.
- Check the sensor input port of MPU (IC1 on the MS-58 board).

When REC inhibit sensors (⑦ to ⑨) are NG
- Check the corresponding sensor on the MS-58 board.
- Check the sensor input port of MPU (IC1 on the MS-58 board).


Cassette tab sensors
① Reel hub sensor
② Metal/oxide tape sensor
③ Tape thickness sensor
④ Spare sensor 2
⑤ Spare sensor 1
⑥ Digital/analog tape sensor
⑨ L cassette (SP) REC inhibit switch Sensor
⑧ L cassette (SX) REC inhibit switch Sensor
⑦ S cassette REC inhibit switch Sensor

Locations of Sensors (Switches)

C001 : CASSETTE COMP. SW

This submenu checks the sensor (switch) function of a compartment.

```
SERVO CHECK
 INPUT CHECK

C001:CASSETTE COMP. SW
 SW1:CASSETTE IN SW 1
 SW2:CASSETTE IN SW 2
 SW3:LARGE CASSETTE SW

      3  1      2
```

(1) Push up the cassette door to the inside with fingers.

(2) Push each sensor (switch) in the direction indicated by the arrow with fingers. These switches interlock with sensors.

Switch	Sensor
SW1 : Cassette-in switch 1	Cassette-in sensor (L)
SW2 : Cassette-in switch 2	Cassette-in sensor (R)
SW3 : L cassette detection switch	Cassette size sensor

(Ex.)

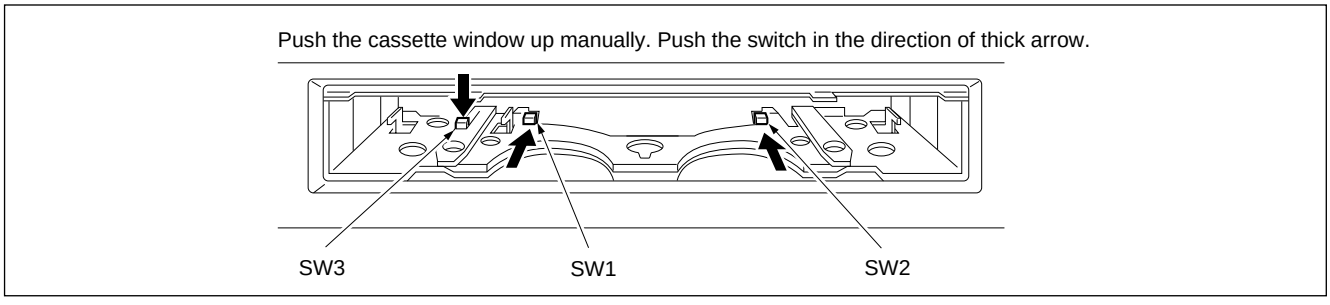
```
SERVO CHECK
 INPUT CHECK

C001:CASSETTE COMP. SW
 SW1:CASSETTE IN SW 1
 SW2:CASSETTE IN SW 2
 SW3:LARGE CASSETTE SW

      3  □      2
```

- Confirm that the corresponding switch number changes to "□".
  Then release the fingers.
- Confirm that "□" returns to the former switch number.

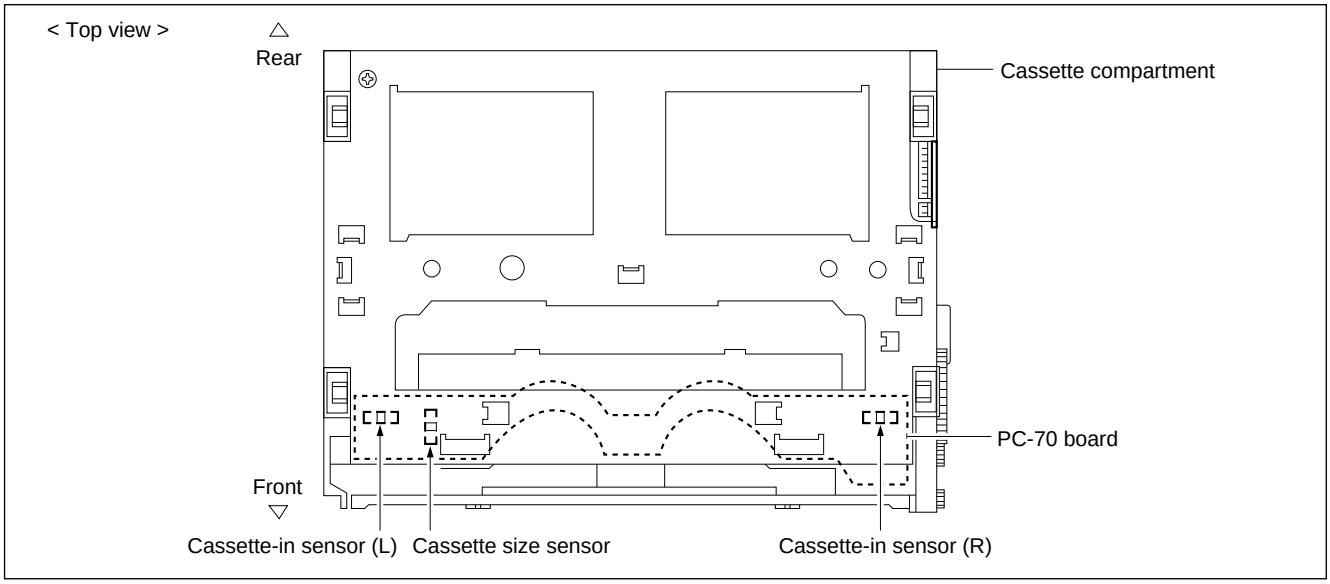
(3) Press the MENU button when terminating the check.

In case of NG

- Check the corresponding sensor on the PC-70 board.
- Check the sensor input port of MPU (IC1 on the MS-58 board).



Locations of Switches in Compartment Block



Locations of Sensors

C002 : TOP/END SENSOR

This submenu checks the functions of a tape top sensor and tape end sensor.

```
SERVO CHECK
 INPUT CHECK

C002:TOP/END SENSOR

   END          TOP
 SENSOR       SENSOR

   OFF          OFF
```

(1) Bring a metallic screwdriver near each sensor.
- Confirm that the characters below the corresponding sensor change from "OFF" to "ON!".

CAUTION

Never bring the screwdriver into contact with each sensor.

(2) Keep the screwdriver away from each sensor.
- Confirm that the characters below the corresponding sensor return from "ON!" to "OFF".

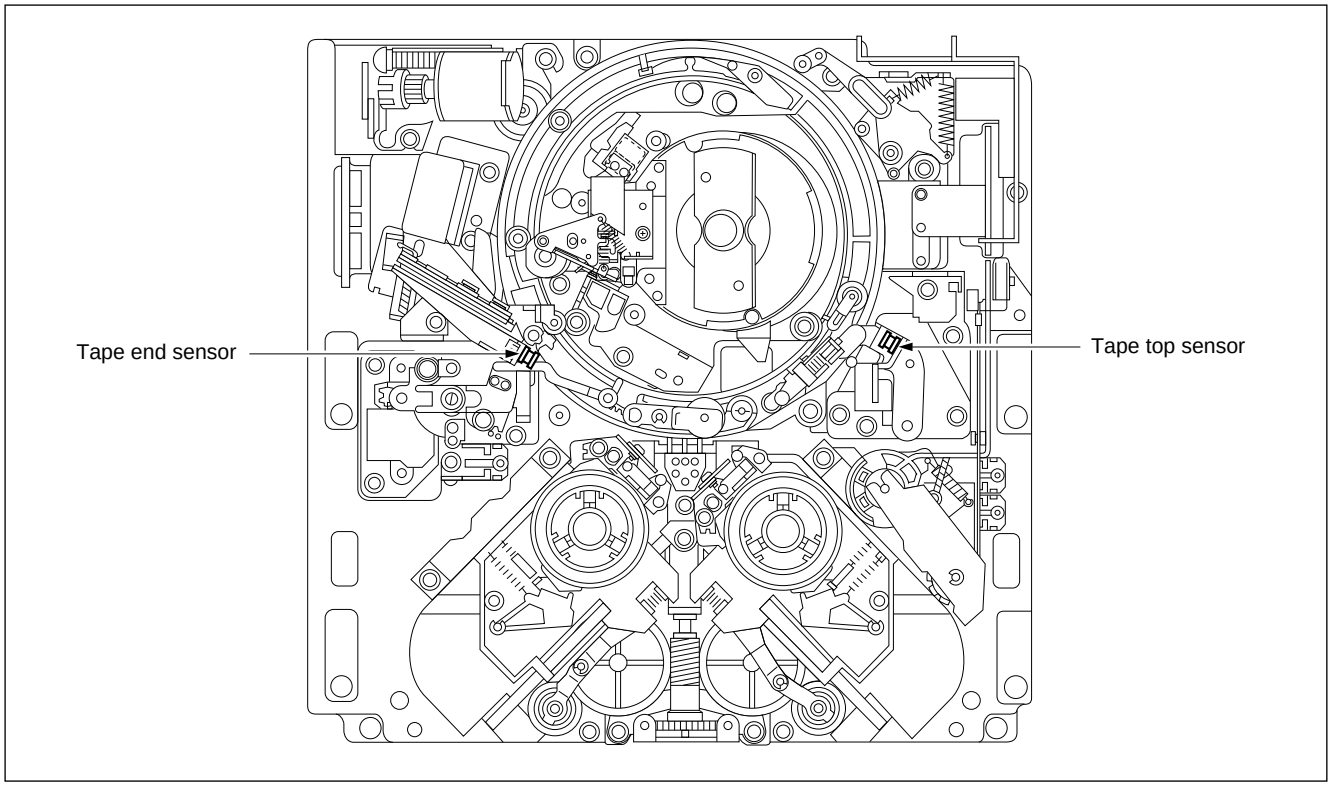
(Ex.)

```
SERVO CHECK
 INPUT CHECK

C002:TOP/END SENSOR

   END          TOP
 SENSOR       SENSOR

   OFF          ON!
```

(3) Press the MENU button when terminating the check.

In case of NG

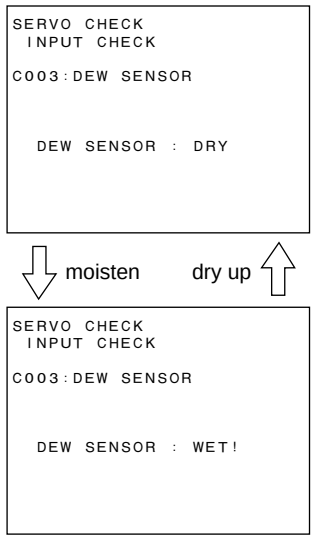
- Check each sensor itself.
- Check the oscillator and detection circuit (on the MS-58 board) for sensors.
- Check the sensor input port (IC115 on the SS-83 board).



Locations of Tape Top and Tape End Sensors

C003 : DEW SENSOR

This submenu checks the function of a dew condensation sensor.



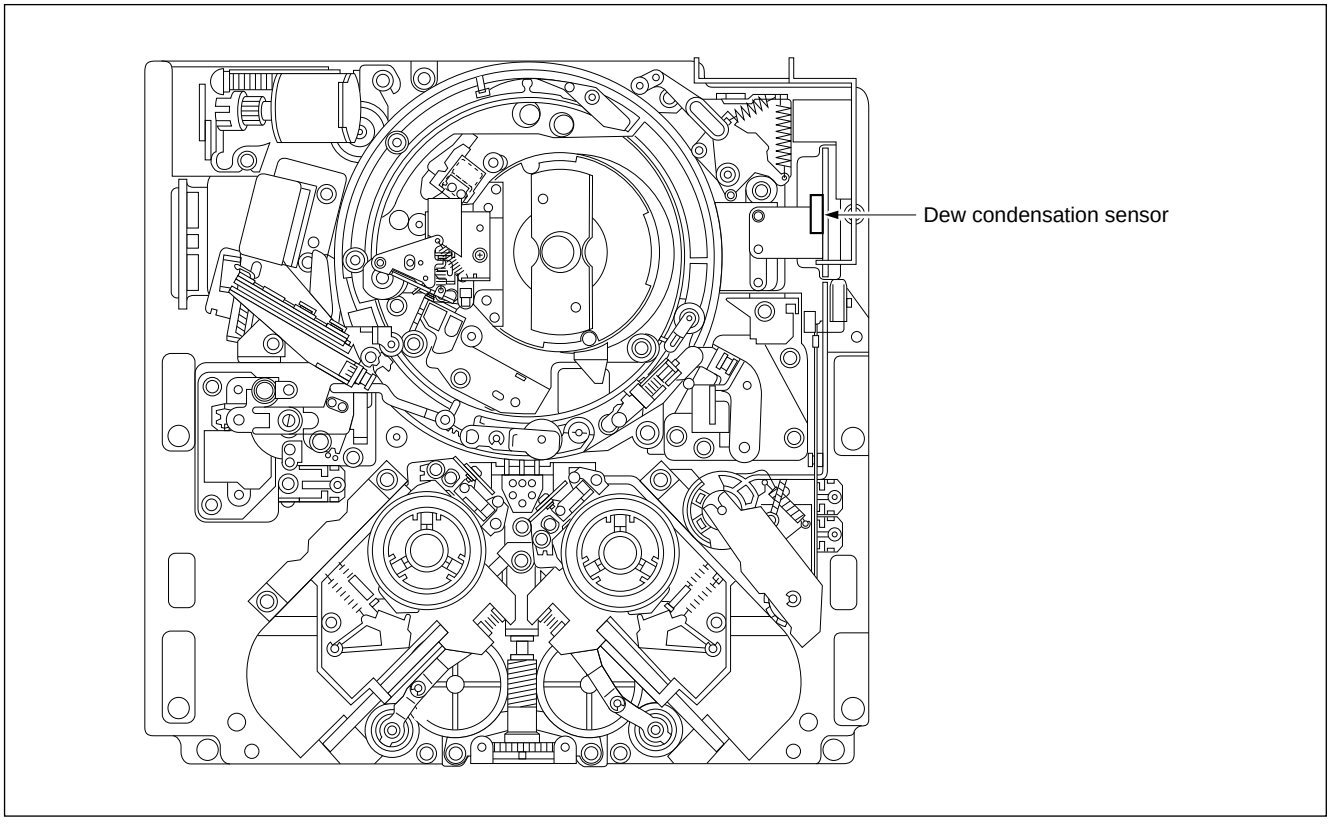
(1) Slightly touch the sensor with the cotton swab moistened with water.
- Confirm that the “DRY” characters change to “WET!”.

(2) Wipe the sensor with a dry cotton swab to eliminate the moisture or evaporate moisture completely using a blower.
- Confirm that the “WET!” characters return to “DRY”.

(3) Press the MENU button when terminating the check.

In case of NG

- Check the sensor itself.
- Check the detection circuit (on the MS-58 board).
- Check the sensor input port of MPU (IC1 on the MS-58 board).



Location of Dew Condensation Sensor

http://getMANUAL.com

C010 : S REEL MOTOR
C011 : T REEL MOTOR

```
SERVO CHECK
 MOTOR CHECK
C010:S REEL MOTOR



 TURN JOG DIAL
      IN JOG MODE
```

These menus check the function of an S reel motor or T reel motor.

(1) Turn the search dial (JOG mode) in FORWARD (↻) or REVERSE (↺) direction.
Confirm that the reel table rotates in the specified direction at a fixed speed (about one turn per second) after the reel brake is released.

```
SERVO CHECK
 MOTOR CHECK
C011:T REEL MOTOR



 TURN JOG DIAL
      IN JOG MODE
```

Search dial	Rotation direction of reel table
FORWARD (↻)	Clockwise (↻)
REVERSE (↺)	Counterclockwise (↺)

(2) Stop the rotation of the search dial and confirm that the reel table stops and that the reel brake operates.

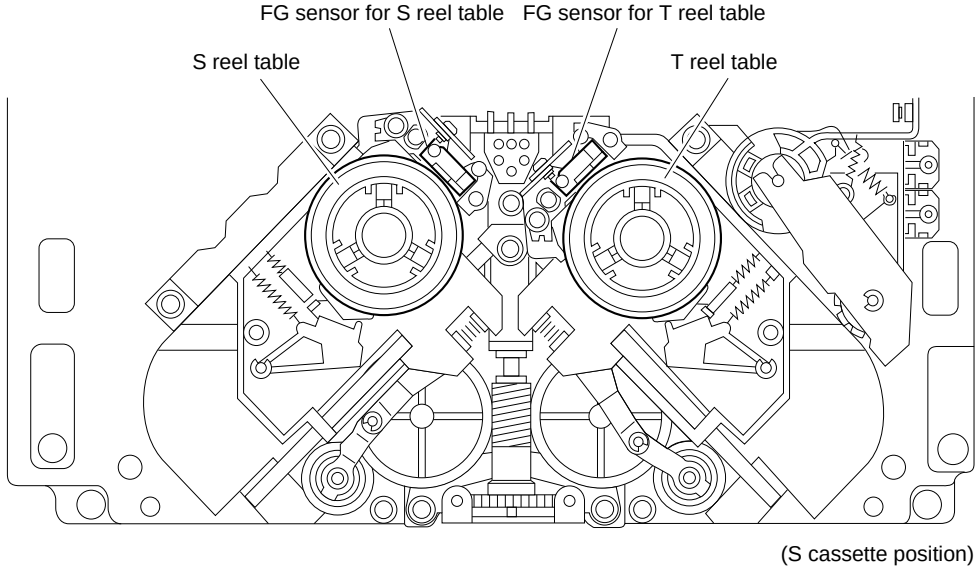
(3) Press the MENU button when terminating the check.

In case of NG

When the reel table operation is defective
- Check the reel motor drive circuit (on the DR-315 board).
- Check the reel motor.

When the reel table is not constant at a rotation speed
- Adjust the duty ratio of an S/T reel FG. (A001/A002)
- Check the FG output from a reel table FG sensor (DME on the SE-344 board).
- Check the reel FG shaping circuit (on the MS-58 board).

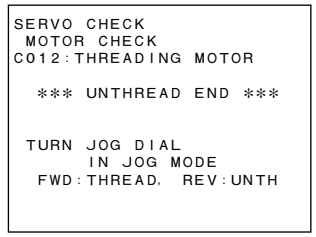
When the brake solenoid operation is defective
- Check the S/T brake solenoid. (C021/C022)



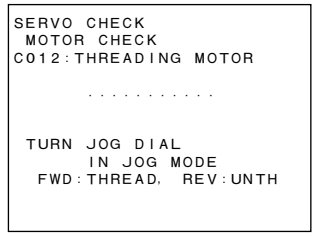
Locations of Reel Table FG Sensors

C012 : THREADING MOTOR

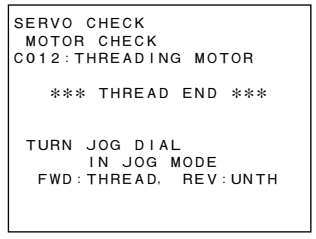
This menu checks the functions of a threading motor and threading end sensor/ unthreading end sensor.



DIAL (↻) DIAL (↺)



DIAL (↻) DIAL (↺)



(1) Turn the search dial (JOG mode) slowly in FORWARD (↻) direction.
- Confirm that the threading motor rotates and that the threading ring rotates counterclockwise (↺) and stops in the threading end state.
- Confirm that the superimpose picture display changes as described below.
  UNTHREAD END ⇨ ..... ⇨ THREAD END

Note

The threading motor also stops when the rotation of the search dial stops.

(2) Turn the search dial (JOG mode) slowly in REVERSE (↺) direction.
- Confirm that the threading motor rotates and that the threading ring rotates clockwise (↻) and stops in the unthreading end state.
- Confirm that the superimpose picture display changes as described below.
  THREAD END ⇨ ..... ⇨ UNTHREAD END

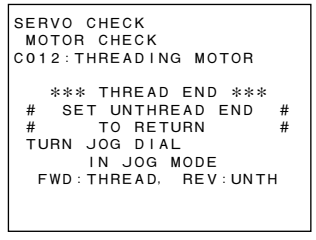
Note

The threading motor also stops when the rotation of the search dial stops.

(3) To terminate the check, return to the unthreading end state and press the MENU button.

Note

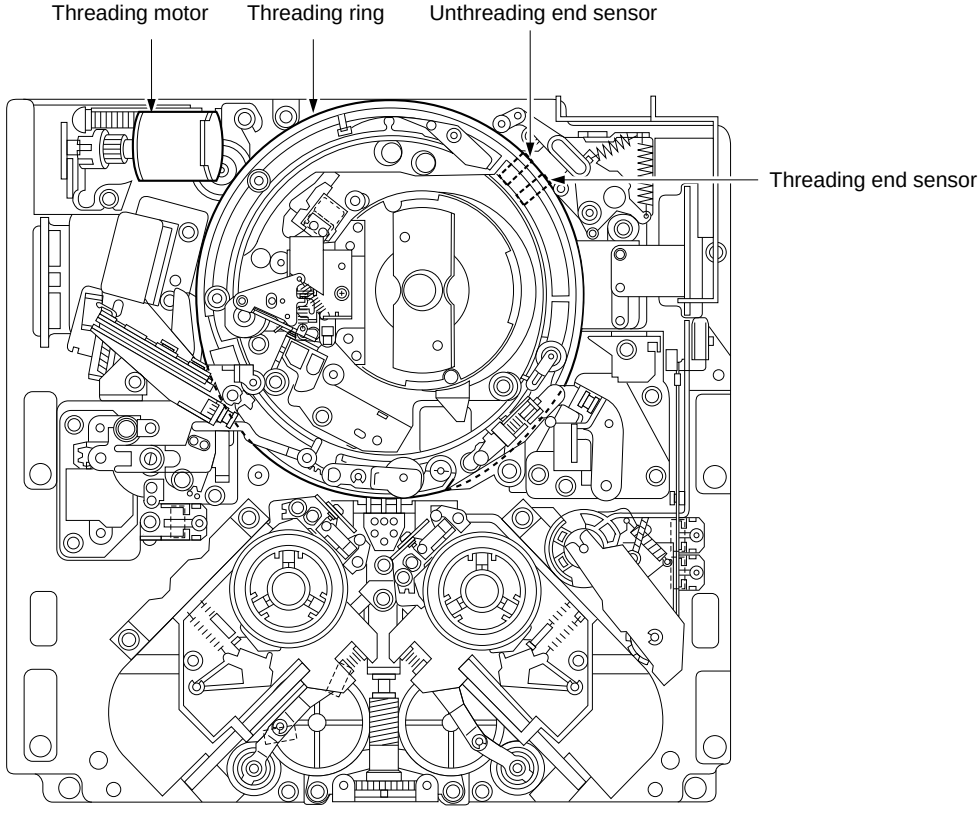
Message “SET UNTHREAD END TO RETURN” is displayed if the threading ring is not in the unthreading end state when the MENU button is pressed.



In case of NG

When the threading ring (threading motor) operation is defective
- Confirm that no mechanical abnormality exists.
- Check the threading motor drive circuit (on the DR-315 board).
- Check the threading motor.

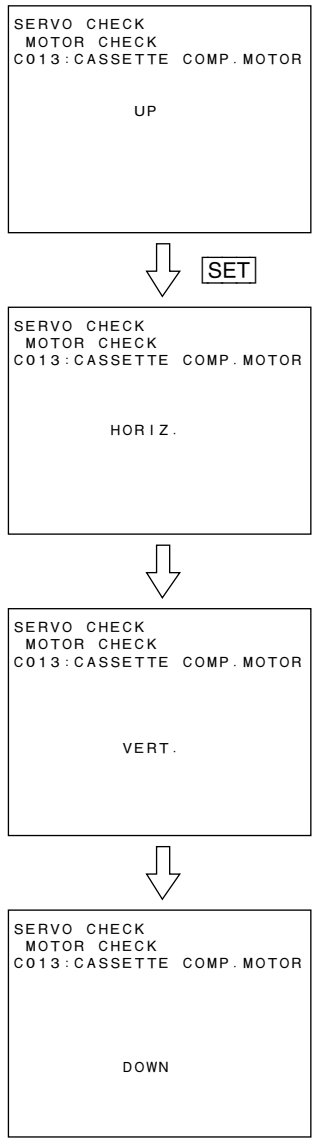
When the superimpose picture does not display the threading end state or unthreading end state even if the threading ring is in the threading end state or unthreading end state
- Check the threading end sensor and unthreading end sensor (on the TR-79 board).
- Check the sensor input port of MPU (IC1 on the MS-58 board).



Locations of Threading End and Unthreading End Sensors

C013 : CASSETTE COMP. MOTOR

This menu checks the functions of a cassette compartment motor and cassette-down sensor.



CAUTION

Be careful not to execute this menu with the foreign matter put into the cassette compartment.
Remove it when a cassette tape is located in the cassette insertion slot. The cassette is caught halfway when this menu is executed in this state.

Note

- "HORIZ." or "VERT." is displayed when this menu is selected in the state where the cassette compartment has stopped halfway due to abnormality.
- The power supply to the motor stops to protect the motor and movable part when the driving time of a motor continuously exceeds about six seconds due to abnormality.

(1) Press the SET button when "UP" is displayed.
  - Confirm that the compartment goes down.
  - Confirm that the screen display of the video monitor changes as described below.
    UP ⇨ HORIZ. ⇨ VERT. ⇨ DOWN

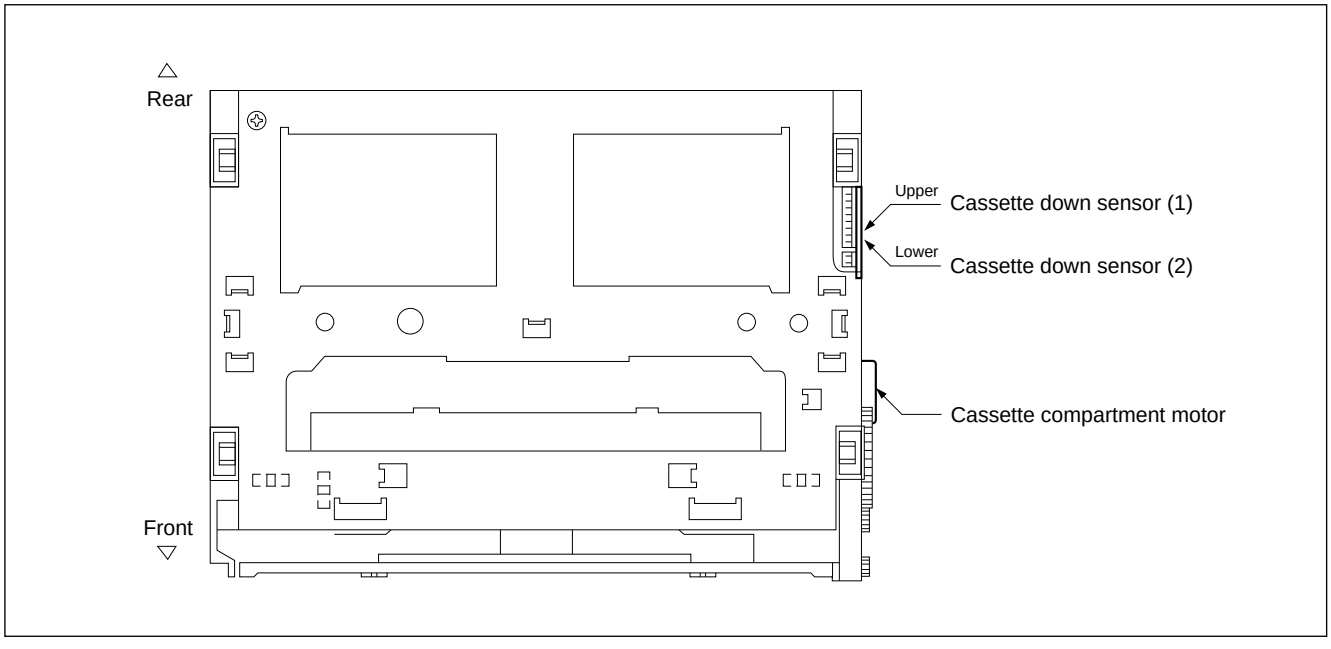
(2) Press the SET button when "DOWN" is displayed.
  - Confirm that the compartment goes up.
  - Confirm that the screen display of the video monitor changes as described below.
    DOWN ⇨ VERT. ⇨ HORIZ. ⇨ UP

(3) Press the MENU button when terminating the check.

In case of NG

When the compartment operation is defective
- Confirm that no mechanical abnormality exists.
- Check the motor drive circuit of the cassette compartment (on the DR-315 board).
- Check the cassette compartment motor.

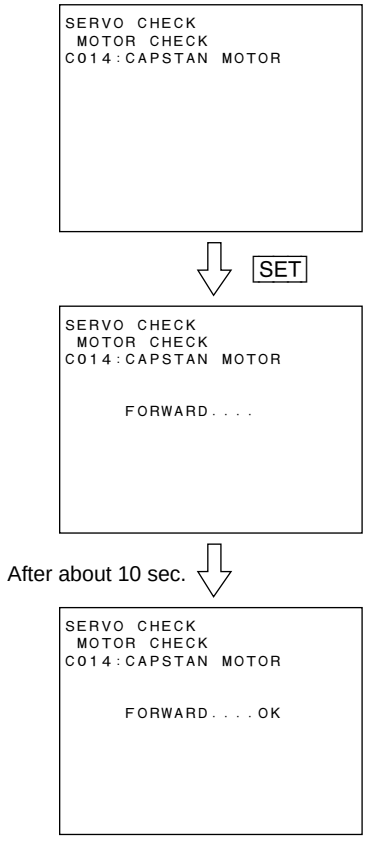
When the actual compartment position does not coincide with the display on the superimpose picture
- Check the cassette-down sensor (on the CL-29 board).
- Check the sensor input port of MPU (IC1 on the MS-58 board).



Top View of Cassette Compartment

C014 : CAPSTAN MOTOR

This menu checks the function of a capstan motor.



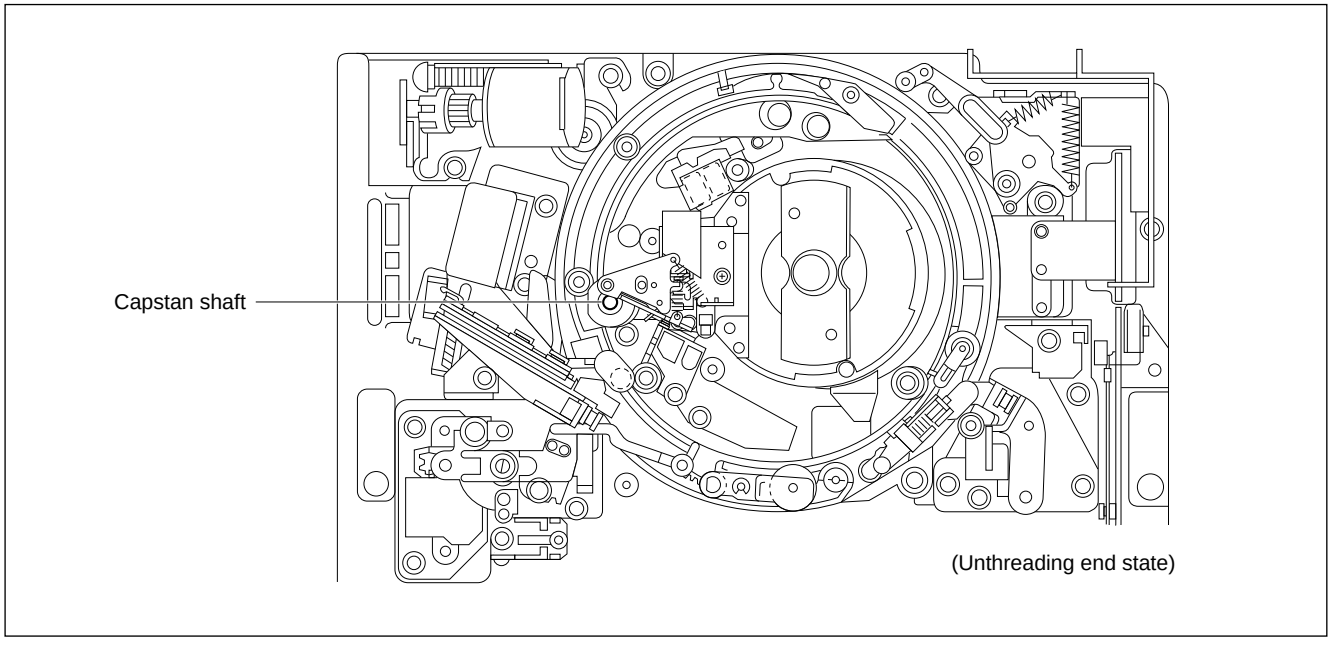
(1) Press the SET button.
- Confirm that the capstan shaft rotates in the forward (↺) direction.
- Confirm that message “FORWARD....OK” is displayed on the superimpose picture and that the capstan shaft stops.

(2) Press the SET button again.
- Confirm that the capstan shaft rotates in the reverse (↻) direction.
- Confirm that message “REVERSE....OK” is displayed on the superimpose picture and that the capstan shaft stops.

(3) Press the MENU button when terminating the check.

In case of NG

- Confirm that no mechanical abnormality exists.
- Check the capstan motor drive circuit (on the DR-315 board).
- Check the FG output from a capstan motor.
- Check the capstan FG shaping circuit (on the MS-58 board).
- Check each circuit that processes the capstan FG on the SS-83 board.
- Check the capstan motor.



Location of Capstan Shaft

C015 : DRUM MOTOR

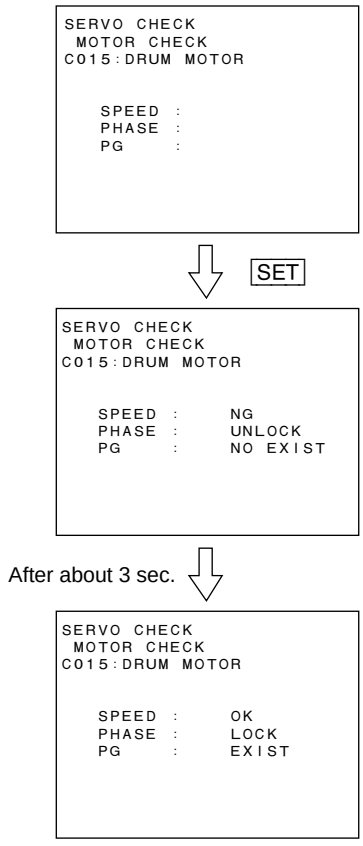
This menu checks the function of a drum motor.

(1) Press the SET button.
- Confirm that the drum rotates.
- Confirm that the superimpose picture display changes as shown on the right.

(2) Press the MENU button when terminating the check.
- Confirm that the drum stops.

In case of NG

- Confirm that no mechanical abnormality exists.
- Check the drum motor drive circuit (on the DR-315 board).
- Check the FG and PG outputs from a drum motor.
- Check the drum FG/PG shaping circuit (on the DR-315 board).
- Check each circuit that processes the drum FG/PG on the SS-83 board.

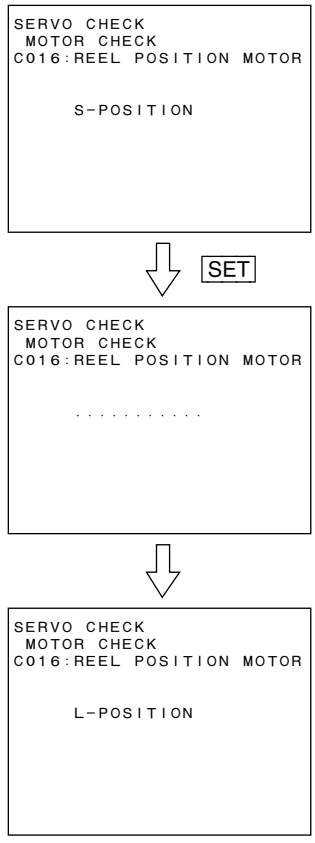


C016 : REEL POSITION MOTOR

This menu checks the functions of a reel shift motor and reel position sensor.

Note

The power supply to the motor stops to protect the motor and movable part when the driving time of a motor continuously exceeds about six seconds due to abnormality.



(1) Press the SET button when S-POSITION is displayed.
- Confirm that the reel shift motor rotates and that the reel table moves from the S position (S cassette position) to the L position (L cassette position).
- Confirm that the superimpose picture display changes as described below.
  S-POSITION ⇨ ..... ⇨ L-POSITION

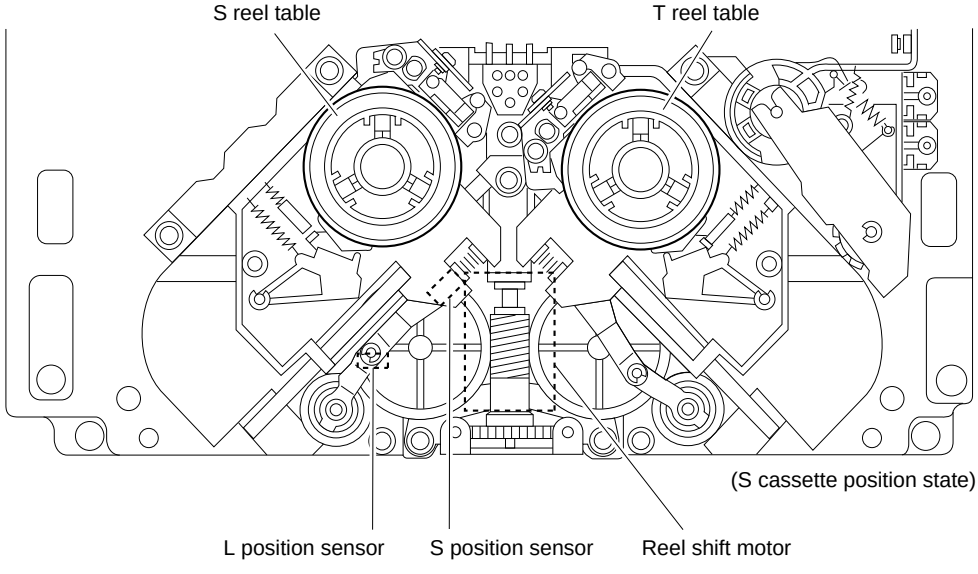
(2) Press the SET button when L-POSITION is displayed.
- Confirm that the reel shift motor rotates and that the reel table moves from L position (L cassette position) to the S position (S cassette position).
- Confirm that the superimpose picture display changes as described below.
  L-POSITION ⇨ ..... ⇨ S-POSITION

(3) Press the MENU button when terminating the check.

In case of NG

When the reel table (reel shift motor) operation is defective
- Confirm that no mechanical abnormality exists.
- Check the drive circuit of the reel shift motor (on the DR-315 board).
- Check the reel shift motor.

When the superimpose picture does not display the S or L position state even if the reel table is in the S position (S cassette position) or L position (L cassette position)
- Check the S and L position sensors (on the PTC-71 board).
- Check the sensor input port of MPU (IC1 on the MS-58 board).



Locations of S and L Position Sensors and Reel Shift Motor

C020 : PINCH ROLLER

This menu checks the function of a pinch roller solenoid.

```
SERVO CHECK
 PLUNGER SOLENOID
C020:PINCH ROLLER
```

(1) Press the SET button.
- Confirm that the pinch lever comes near a capstan and makes sound when the pinch roller solenoid is turned on.

(2) Press the MENU button.
- The drive voltage of the pinch roller solenoid is turned off and the check menu is terminated.

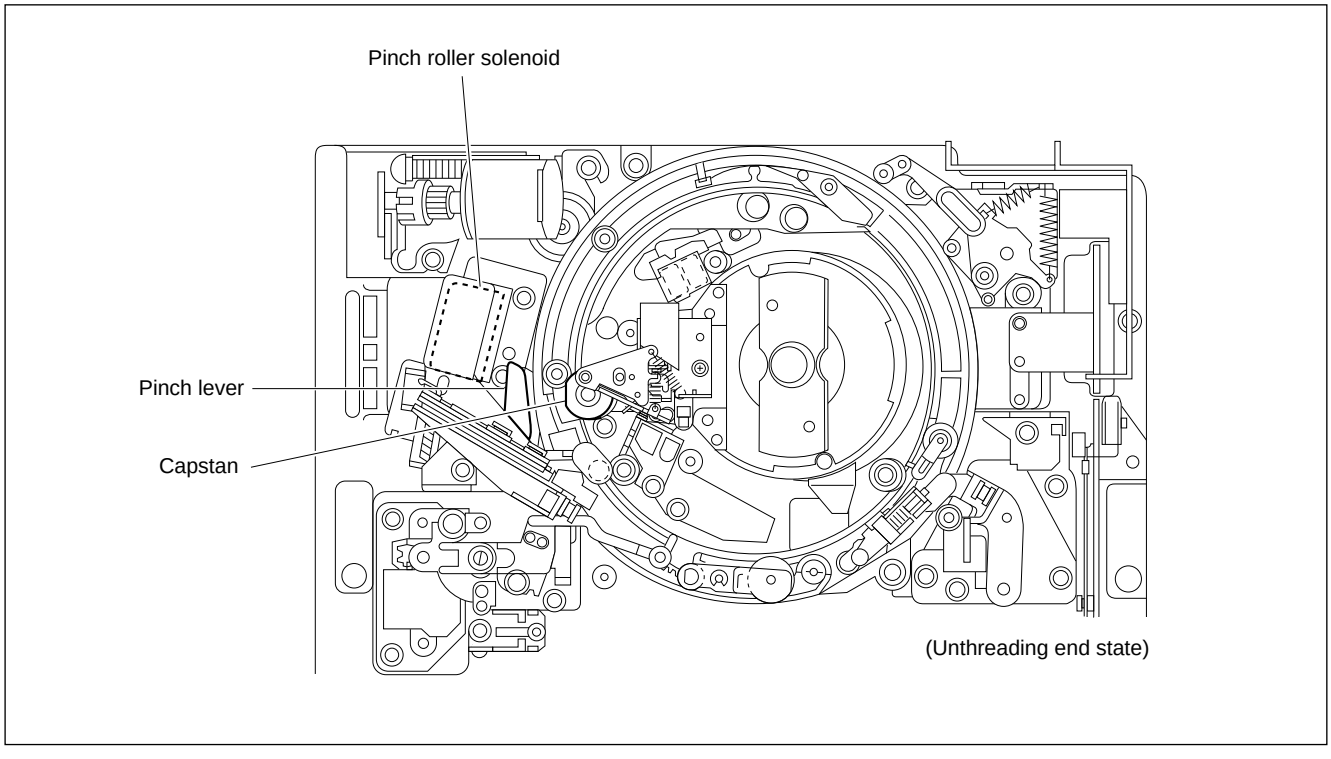
(3) Slightly push the pinch lever toward the pinch roller solenoid with fingers.

Note

The sound when the pinch roller solenoid is turned on is not generated even if the SET button is pressed in this menu with the iron core is not returned to the former position.

In case of NG

- Confirm that no mechanical abnormality exists.
- Check the drive circuit of the pinch roller solenoid (on the DR-315 board).
- Check the pinch roller solenoid itself.



Locations of Pinch Roller Solenoid and Pinch Lever

C021 : S REEL BRAKE
C022 : T REEL BRAKE

These menus check the function of an S or T reel brake solenoid.

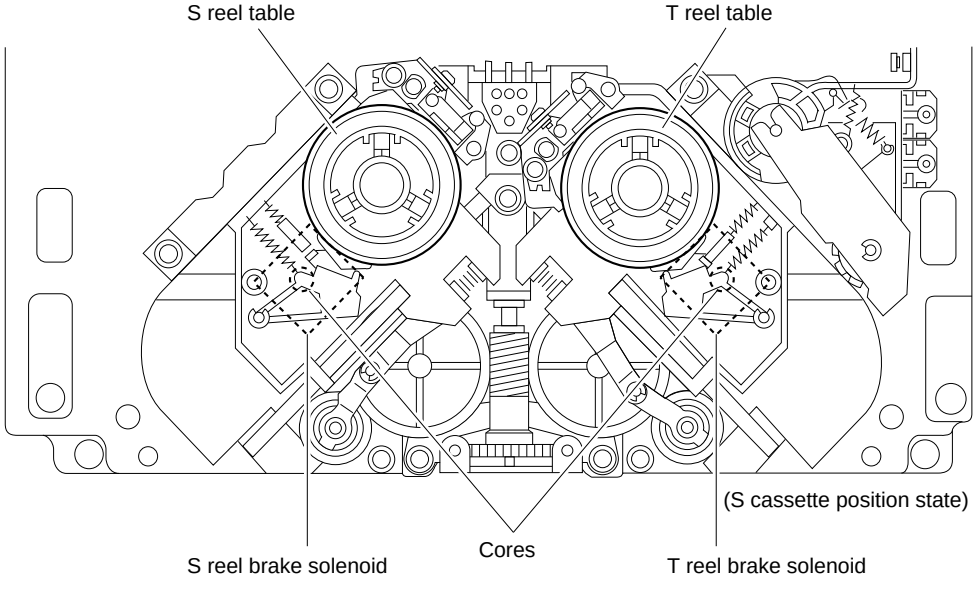
```
SERVO CHECK
 PLUNGER SOLENOID
C021:S REEL BRAKE
```

(1) Press the SET button.
- Confirm with sound that the reel brake solenoid is turned on. (The reel table can be lightly turned with hand because the brake is in the OFF state.)

```
SERVO CHECK
 PLUNGER SOLENOID
C022:T REEL BRAKE
```

(2) Press the MENU button.
- The check menu is terminated.
- Confirm by the brakes applied to the reel table that the reel brake solenoid was turned off.

In case of NG
- Confirm that no mechanical abnormality exists.
- Check the drive circuit of the reel brake solenoid (on the DR-315 board).
- Check the reel brake solenoid itself.



Locations of Reel Brake Solenoids

http://getMANUAL.com

C023 : CLEANING ROLLER

This menu checks the function of a cleaning roller solenoid.

```
SERVO CHECK
 PLUNGER SOLENOID
C023:CLEANING ROLLER
```

(1) Press the SET button.
- Confirm that the cleaning roller solenoid operates and that the cleaning roller momentarily touches the drum and is immediately released from it.

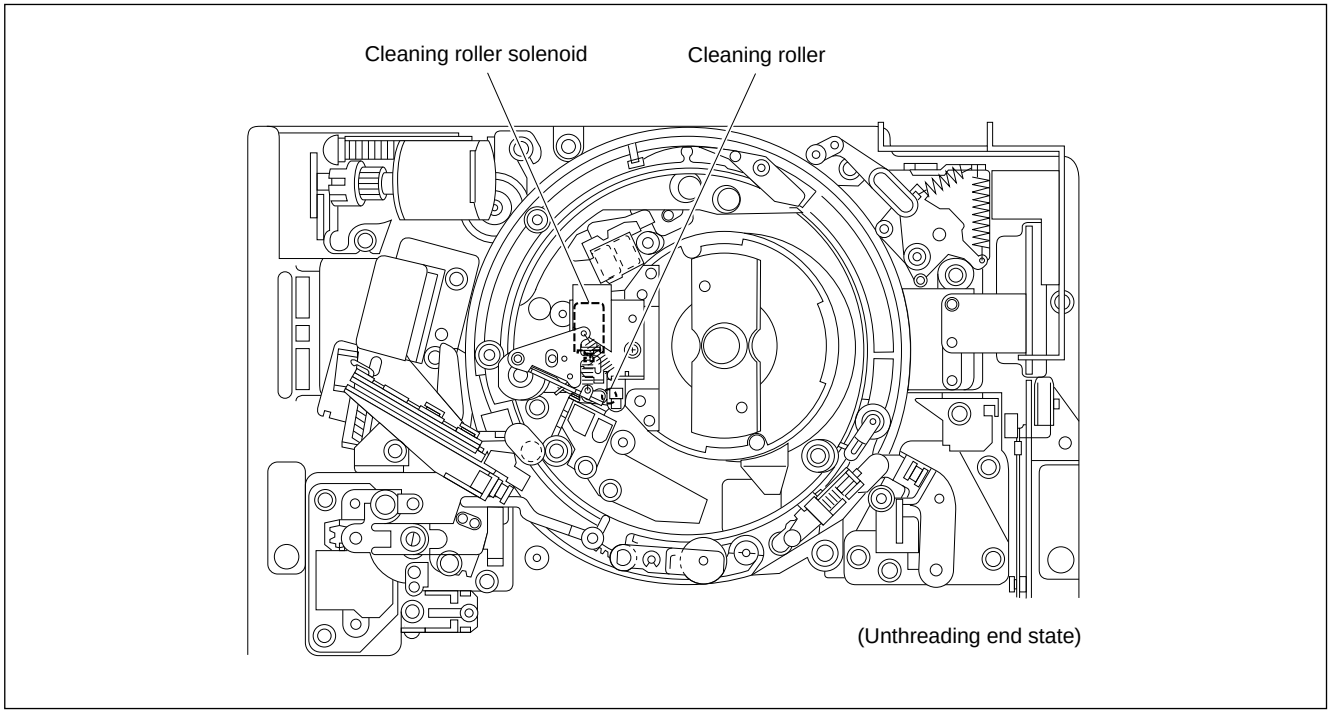
CAUTION

The cleaning roller solenoid causes burning when it remains on. If the cleaning roller is not away from the drum, turn off the power immediately.

(2) Press the MENU button when terminating the check.

In case of NG

- Confirm that no mechanical abnormality exists.
- Check the drive circuit of the cleaning roller solenoid (on the DR-315 board).
- Check the cleaning roller solenoid itself.



Locations of Cleaning Roller and Cleaning Roller Solenoid

C03 : REEL/CAPSTAN MOTOR & FG CHECK

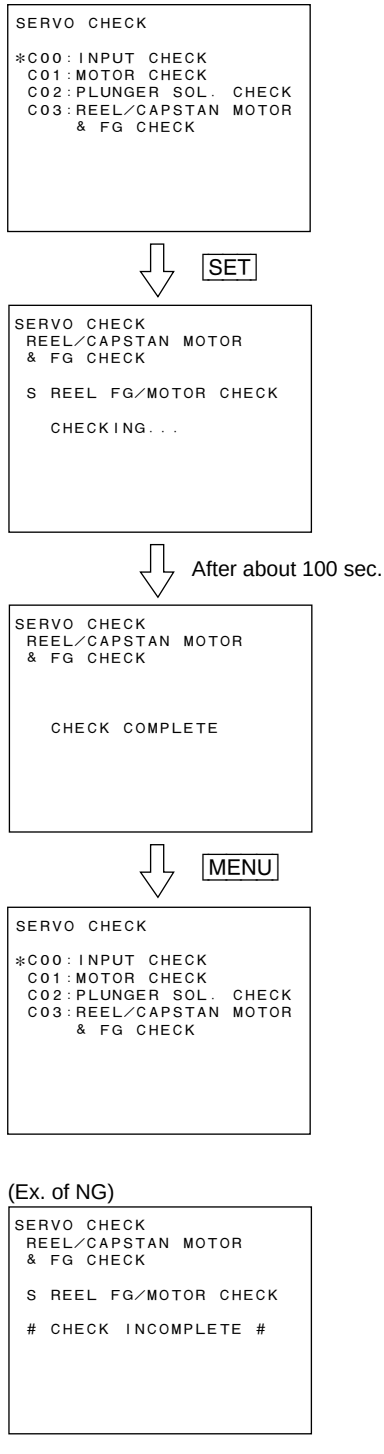
This menu checks the following items automatically and continuously.

- S reel FG duty ratio (C031 : S REEL FG/MOTOR CHECK)
- T reel FG duty ratio (C032 : T REEL FG/MOTOR CHECK)
- Capstan FG duty ratio (C033 : CAPSTAN FG/MOTOR CHECK)
- S reel offset/friction level (C034 : S REEL OFFSET/FRICTION)
- T reel offset/friction level (C035 : T REEL OFFSET/FRICTION)
- S reel motor torque (C036 : S REEL MOTOR TORQUE)
- T reel motor torque (C037 : T REEL MOTOR TORQUE)

(1) Select C03 in the servo check mode and press the SET button to start the check.
  - The item name to be checked is displayed on the superimpose picture, and the menu number (C031 to C037) is displayed in a time data display area.

(2) Confirm that all checks are completed and that message “CHECK COMPLETE” is displayed.
If message “# CHECK INCOMPLETE #” is displayed halfway, refer to the NG cases during check below.

(3) Press the MENU button to return to the selection of the servo check mode.



(Ex. of NG)

For NG during (C031) S REEL FG/MOTOR CHECK

Perform the S reel motor check (C010). If no abnormality is found in the motor or its drive circuit, perform the S reel FG duty adjustment (A001).

For NG during (C032) T REEL FG/MOTOR CHECK

Perform the T reel motor check (C011). If no abnormality is found in the motor or its drive circuit, perform the T reel FG duty adjustment (A002).

For NG during (C033) CAPSTAN FG/MOTOR CHECK

Perform the capstan motor check (C014). If no abnormality is found in the motor or its drive circuit, perform the capstan FG duty adjustment (A003).

For NG during (C034) S REEL OFFSET/FRICTION

Perform the S reel motor check (C010). If no abnormality is found in the motor or its drive circuit, perform the S reel offset/friction adjustment (A004).

For NG during (C035) T REEL OFFSET/FRICTION

Perform the T reel motor check (C011). If no abnormality is found in the motor or its drive circuit, perform the T reel offset/friction adjustment (A005).

For NG during (C036) S REEL MOTOR TORQUE

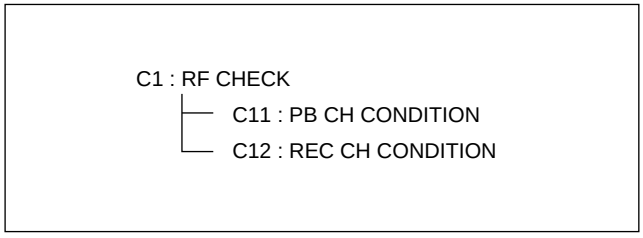
Perform the S reel motor check (C010). If no abnormality is found in the motor or its drive circuit, perform the S reel torque adjustment (A006).

For NG during (C037) T REEL MOTOR TORQUE

Perform the T reel motor check (C011). If no abnormality is found in the motor or its drive circuit, perform the T reel torque adjustment (A007).

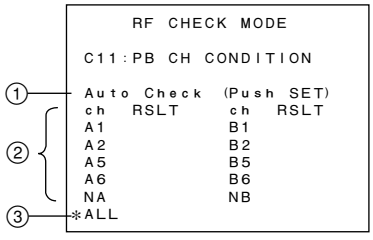
3-2-3. RF CHECK Mode (C1)

The C1 : RF CHECK mode is used to check the PB RF system based on an Betacam SX format.
Two menus are available.



Menu Tree of RF System Check Mode

C11 : PB CH CONDITION



In these menus, the error condition for each channel is displayed in three steps (GRN, YEL, and RED) when the tape recorded based on a Betacam SX format is played back by tracking.
C11 checks using the PB signal from the PB heads in A1, A2, A5, A6, B1, B2, B5, B6, CNFA, and CNFB channels in the PB mode.

Notes

- During normal operation, the tape is played back by non-tracking. Therefore, the condition for each channel cannot be confirmed using a CH CONDITION indicator.
- If abnormality exists in the servo system, each menu of C1 : RF CHECK does not function normally.

Description of superimpose picture

① The display in this line changes. Each display and its meaning are described below.

Auto Check (Push SET) :	Press the SET button to start the check.
Insert SR5-1 :	Insert an alignment tape.
Auto Tracking... :	Tracking is in an optimization process.
Auto Checking... :	Check is in progress.
Auto Check Complete :	Check is completed.
Auto Check Failure :	Check failure
Condition NG :	Error condition defect

② Select using an * mark when checking the condition for each channel.
After the check is completed, the condition (GRN, YEL, or RED) is displayed on the right of a channel name. "RED" is displayed even if the check fails.

Notes

- "RSLT" indicates the result.
- "NA", "NB" indicate CNFA, CNFB.

③ Select ALL when checking the condition for all channels.
During check, the condition in each channel is displayed in area ②.
After the check for all channels is completed, "GRN" is also displayed on the right of ALL if the condition for all channels is GRN. If there is at least one channel whose condition is YEL or RED, the worst condition is displayed on the right of ALL.

To execute the check

(1) Insert the cassette tape recorded by a Betacam SX format.

Notes

- The tape amount on the recorded portion that is played back after a cassette tape is inserted must exceed the check execution time.
  The check execution time for each channel is usually about ten seconds and about 80 seconds in an ALL check.
- Usually, use alignment tape SR5-1 (for a 525/60 system) or SR5-1P (for a 625/50 system).

(2) Turn the search dial and move the ∗ mark to the channel to be checked or ALL.

- Usually, select ALL.

(3) Press the SET button.

- The tape is automatically played back in the PLAY mode. The check is then initiated.
- Message “Auto Tracking ...” or “Auto Checking ...” is displayed on the superimpose picture.
  During ALL check execution, the check result in the channel is displayed every time a one-channel check is completed.
  The time data display area displays an ordinary time counter.
- To cancel the check, press the MENU button.

Notes

- Message “Insert SR5-1” is displayed on the superimpose picture when no cassette tape is inserted. The tape is automatically played back in the PLAY mode when a cassette tape is inserted. The check is then initiated.
- If message “Auto Check (Push SET)” is continuously displayed on the superimpose picture, the non-recorded portion on the tape is judged to be played back from the beginning. Change the playback position on the tape.
- Check cannot be properly performed in modes other than PLAY mode. Leave the check as it is until automatic check is completed. If modes other than PLAY mode are entered, the check cannot be performed any longer or the condition becomes “RED”.

(4) Confirm the check result on the superimpose picture.

- If no abnormality is found, “GRN” is displayed on the right of the selected channel or ALL.
- Refer to the “For Check Failure” on page 3-33 when message “Auto Check Failure” is displayed on the superimpose picture.
- Refer to the “For Condition NG” on page 3-32 when message “Condition NG” is displayed on the superimpose picture or when conditions other than “GRN” are displayed on the right of the checked channel.

Notes

- Refer to the “For Check Failure” on page 3-33 when the check result in all channels is “RED” even if message “Condition NG” is displayed on the superimpose picture during ALL check execution.
- “GRN”, “YEL”, or “RED” is displayed in a time data display area. In only the time data display area, it cannot be confirmed whether the condition is NG or check failure when it is “RED”.
  The check result for each channel is displayed when the search dial is turned after performing ALL check.

(5) Press the MENU button when terminating the menu.
To execute the check again in this menu, return to step (2).

Note

To change the playback tape before starting the check, press the SET button while pressing the EJECT button. The tape is then ejected without influencing the check result. Insert another tape and press the PLAY button. The check is then initiated. This operation does not coincide with the message on the superimpose picture.

Example of display and operation

ALL is selected in C11 : PB CH CONDITION.

Superimpose picture

```
     RF CHECK MODE

 C11:PB CH CONDITION

 Auto Check  (Push SET)
 ch   RSLT     ch   RSLT
 A1            B1
 A2            B2
 A5            B5
 A6            B6
 NA            NB
*ALL
```

Time data display area

```
C11 -ALL
```

(1) ⇩ Insert SR5-1/SR5-1P
(2) ⇩ Select
(3) ⇩ [SET]

```
     RF CHECK MODE □

 C11:PB CH CONDITION

 Auto Tracking ...
 ch   RSLT     ch   RSLT
 A1            B1
 A2            B2
 A5            B5
 A6            B6
 NA            NB
*ALL
```

⇩

```
     RF CHECK MODE □

 C11:PB CH CONDITION

 Auto Checking ...
 ch   RSLT     ch   RSLT
 A1            B1
 A2            B2
 A5            B5
 A6            B6
 NA            NB
*ALL
```

⇩

```
     RF CHECK MODE □

 C11:PB CH CONDITION

 Auto Check Complete
 ch   RSLT     ch   RSLT
 A1   GRN      B1
 A2            B2
 A5            B5
 A6            B6
 NA            NB
*ALL
```

⇩

```
     RF CHECK MODE □

 C11:PB CH CONDITION

 Auto Tracking ...
 ch   RSLT     ch   RSLT
 A1   GRN      B1
 A2            B2
 A5            B5
 A6            B6
 NA            NB
*ALL
```

⇩
(omitted)
⇩
(continue)

(continued)
⇩

```
     RF CHECK MODE

 C11:PB CH CONDITION

 Auto Check Complete
 ch   RSLT     ch   RSLT
 A1   GRN      B1   GRN
 A2   GRN      B2   GRN
 A5   GRN      B5   GRN
 A6   GRN      B6   GRN
 NA   GRN      NB   GRN
*ALL GRN
```

Time data display area

```
C11 -ALL GRN
```

(4) ⇩ Confirm
(5) ⇩ [MENU]

For Condition NG

Confirm, recheck, and clean the drum (video heads) according to the procedures below.

(1) If a check is performed using alignment tapes other than SR5-1/SR5-1P, recheck using alignment tape SR5-1/SR5-1P.
If no abnormality is found, the check is completed.

Note

If no abnormality is found during check using an alignment tape, a trouble (tape is damaged or recording is not done properly) is considered to exist in the previously played back tape.

(2) Change the playback portion on the alignment tape, then recheck.
If no abnormality is found, the recheck is completed.

(3) Recheck using an alignment tape after cleaning using a cleaning tape (in Section 2-2-1).
If no abnormality is found, the recheck is completed.

(4) Recheck using an alignment tape after cleaning using a cleaning tape again (the amount of the tape used is 15 seconds).
If no abnormality is found, the recheck is completed.

(5) Recheck using an alignment tape after cleaning the video heads with cleaning cloth.
(Refer to Section 2-2-2 and 2-2-3.)
If no abnormality is found, the recheck is completed.

If the error condition is not improved in the way mentioned above, the possible cause below are considered.

- Servo system adjustment defect or circuit defect
  ⇨ Readjust the servo system.
  (A00-01 : SERVO ADJUST)
  ⇨ Check the servo system.
  (C03 : REEL/CAPSTAN MOTOR & FG CHECK)
- RF system adjustment defect
  ⇨ Readjust the RF system. (A1 : RF ADJUST)
- Worn PB head in the drum assembly
  ⇨ After confirming the hours meter (H02 : DRUM RUNNING HOURS), replace the upper drum assembly as required.
  (Refer to Section 5-2 or 5-3.)
- Adjustment defect in tape transport system or component part installation defect.
  ⇨ Readjust the tape transport system or reinstall the parts.
  (Refer to Sections 5 and 6.)
- EQ-75 board defect
- Drum assembly defect

For Check Failure

Change the playback portion on the tape, then recheck. If no check failure occurs again, a trouble is considered to exist in the previously played back portion.

Confirmation of cassette tape

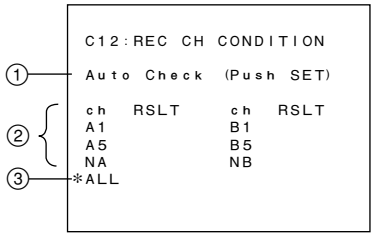
Check failure occurs if the no-recorded portion is played back or the recording format is not in Betacam SX. Moreover, check failure will also occur on the tape recorded by the failled Betacam SX VTR. Confirm that the tape can be correctly played back by the other normal operating Betacam SX VTR.

If no trouble is found on the played back tape

The possible cause below are considered.

- Heads clogging
  ⇨ Perform steps (1) to (5) of “For Condition NG” on previous page.
- Servo system adjustment defect or circuit defect
  ⇨ Readjust the servo system. (A0 : SERVO ADJUST)
  ⇨ Check the servo system. (C03 : REEL/CAPSTAN MOTOR & FG CHECK)
- Brush/slip ring assembly defect or its part installation/ connection defect
  ⇨ Replace or reinstall the brush/slip ring assembly. (Refer to Section 5-4.)
- Harness (between EQ-75 board and drum assembly) connection defect
- RF system adjustment defect
  ⇨ Readjust the RF system. (A1 : RF ADJUST)
- EQ-75 board defect
- Drum assembly defect

C12 : REC CH CONDITION



In this menu, the error condition for each channel is displayed in three steps (GRN, YEL, and RED) when the tape recorded based on a Betacam SX format is played back using the advance PB heads (A1, A5, B1, and B5) by tracking in the insert REC mode, and played back using the confidence PB heads (CNFA and CNFB in the crash REC mode.
C12 checks using the PB signal from the PB heads (A1, A5, B1, B5, CNFA, and CNFB) in the REC mode.

Notes

- Display the channel condition of the A3 and B3 heads in the CH CONDITION area on the time data display area when selecting the CONFIDENCE PB MODE to ON in the crash REC mode.
- During normal operation, the tape is played back by non-tracking. Therefore, the condition for each channel cannot be confirmed using a CH CONDITION indicator.
- If abnormality exists in the servo system, each menu of C1 : RF CHECK does not function normally.

Description of superimpose picture

① The display in this line changes. Each display and its meaning are described below.

Auto Check (Push SET) :	Press the SET button to start the check.
Insert Check Tape :	Insert a tape for check.
Auto Tracking... :	Tracking is in an optimization process.
Auto Checking... :	Check is in progress.
Auto Check Complete :	Check is completed.
Auto Check Failure :	Check failure
Condition NG :	Error condition defect

② Select using a * mark when checking the condition for each channel.
After the check is completed, the condition (GRN, YEL, or RED) is displayed on the right of a channel name. “RED” is displayed even if the check fails.

Notes

- “RSLT” indicates the result.
- “NA”, “NB” indicate CNFA, CNFB.

③ Select ALL when checking the condition for all channels.
During check, the condition in each channel is displayed for area ②.
After the check for all channels is completed, “GRN” is also displayed on the right of ALL if the condition for all channels is GRN. If there is at least one channel whose condition is YEL or RED, the worst condition is displayed on the right of ALL.

To execute the check

(1) Insert the lignment tape SR5-1 (for a 525/60 system) or SR5-1P (for a 625/50 system).

Notes

- The tape amount on the recorded portion that is played back after a cassette tape is inserted must exceed the check execution time. Before check, record a data on blank tape for two minutes or more. The recorded data is rewritten to new data in this menu execution.
  The check execution time for each channel is usually about ten seconds and about 80 seconds in an ALL check.

(2) Turn the seach dial and move the ∗ mark to the channel to be checked or ALL.
- Usually, select ALL.

(3) Press the SET button.
- The tape is automatically recorded back in the REC mode. The check is then initiated.
- Message “Auto Tracking ...” or “Auto Checking ...” is displayed on the superimpose picture.
  During ALL check execution, the check result in the channel is displayed every time a one-channel check is completed.
  The time data display area displays an ordinary time counter.
- To cancel the check, press the MENU button.

Notes

- Message “Insert Check Tape” is displayed on the superimpose picture when no cassette tape is inserted. The tape is automatically played back in the PLAY mode when a cassette tape is inserted. The check is then initiated.
- If message “Auto Check (Push SET)” is continuously displayed on the superimpose picture, the non-recorded portion on the tape is judged to be recorded from the beginning. Change the record position on the tape.
- Check cannot be properly performed in modes other than REC mode. Leave the check as it is until automatic check is completed. If modes other than REC mode are entered, the check cannot be performed any longer or the condition becomes “RED”.

(4) Confirm the check result on the superimpose picture.
- If no abnormality is found, “GRN” is displayed on the right of the selected channel or ALL.
- Refer to the “For Check Failure” on page 3-37 when message “Auto Check Failure” is displayed on the superimpose picture.
- Refer to the “For Condition NG” on page 3-37 when message “Condition NG” is displayed on the superimpose picture or when conditions other than “GRN” are displayed on the right of the checked channel.

Notes

- Refer to the “For Check Failure” on page 3-37 when the check result in all channels is “RED” even if message “Condition NG” is displayed on the superimpose picture during ALL check execution.
- “GRN”, “YEL”, or “RED” is displayed in a time data display area. In only the time data display area, it cannot be confirmed whether the condition is NG or check failure when it is “RED”.
  The check result for each channel is displayed when the search dial is turned after performing ALL check.

(5) Press the MENU button when terminating the menu. To execute the check again in this menu, return to step (2).

Note

To change the playback tape, press the SET button while pressing the EJECT button. The tape is then ejected without influencing the check result. Insert another tape and press the PLAY button. The check is then initiated. This operation does not coincide with the message on the superimpose picture.

Example of display and operation

ALL is selected in C12 : REC CH CONDITION.

Superimpose picture

```
C12:REC CH CONDITION

Auto Check (Push SET)

ch  RSLT    ch  RSLT
A1          B1
A5          B5
NA          NB
*ALL
```

Time data display area

```
C12-ALL
```

(1) ⇩ Insert SR5-1/SR5-1P
(2) ⇩ Select
(3) ⇩ [SET]

```
C12:REC CH CONDITION

Auto Tracking ...

ch  RSLT    ch  RSLT
A1          B1
A5          B5
NA          NB
*ALL
```

⇩

```
C12:REC CH CONDITION

Auto Checking ...

ch  RSLT    ch  RSLT
A1          B1
A5          B5
NA          NB
*ALL
```

⇩

```
C12:REC CH CONDITION

Auto Check Complete

ch  RSLT    ch  RSLT
A1  GRN     B1
A5          B5
NA          NB
*ALL
```

⇩

```
C12:REC CH CONDITION

Auto Tracking ...

ch  RSLT    ch  RSLT
A1  GRN     B1
A5          B5
NA          NB
*ALL
```

⇩
(omitted)
⇩
(continue)

(continued)
⇩

```
C12:REC CH CONDITION

Auto Check Complete

ch  RSLT    ch  RSLT
A1  GRN     B1  GRN
A5  GRN     B5  GRN
NA  GRN     NB  GRN
*ALL GRN
```

Time data display area

```
C12-ALL GRN
```

(4) ⇩ Confirm
(5) ⇩ [MENU]

http://getMANUAL.com

For Channel Condition NG

Confirm, recheck, and clean the drum (video heads) according to the procedures below.

(1) Perform C11 : PB CH CONDITION. When the result is OK, perform (2) and following.
(2) Record a data for two minutes or more after readjusting the recording current (in A12 : REC CURRENT). Then, perform C12 : REC CH CONDITION check again.
If no abnormality is found, recheck and readjustment are completed.

Note

The data is overwritten on a cassette tape in REC CH CONDITION check.
Before check, record a data on a blank tape for two minute or more.

(3) Clean using a cleaning tape (in Section 2-2-1). Then, perform the REC CH CONDITION check after recording a data again for two minutes or more.
If no abnormality is found, the recheck is completed.
(4) Clean using a cleaning tape again (the amount of the tape used is 15 seconds). Then, perform the REC CH CONDITION check after recording a data again for two minutes or more.
If no abnormality is found, the recheck is completed.
(5) Clean with cleaning cloth (Refer to Sections 2-2-2 and 2-2-3). Then, perform the REC CH CONDITION check after recording a data again for two minutes or more.
If no abnormality is found, the recheck is completed.

If the error condition is not improved in the way mentioned above, the possible cause below are considered.

- Servo system adjustment defect or circuit defect
  ⇨ Readjust the servo system. (A00-01 : SERVO ADJUST)
  ⇨ Check the servo system. (C03 : REEL/CAPSTAN MOTOR & FG CHECK)
- Worn PB head in the drum assembly
  ⇨ After confirming the hours meter (H02 : DRUM RUNNING HOURS), replace the upper drum assembly as required.
  (Refer to Section 5-2 or 5-3.)
- Adjustment defect in tape transport system or component part installation defect.
  ⇨ Readjust the tape transport system or reinstall the parts (Refer to Sections 5 and 6.)
- EQ-75 board defect
- Drum assembly defect

For Check Failure

Change the record portion on the tape, then recheck.
If no check failure occurs again, a trouble is considered to exist in the previously recorded portion.

Confirmation of cassette tape

Check failure occurs if the no-recorded portion is recorded or the recording format is not in Betacam SX.
Moreover, check failure will also occur on the tape recorded by the failled Betacam SX VTR. Confirm that the tape recorded by this unit can be correctly played back.

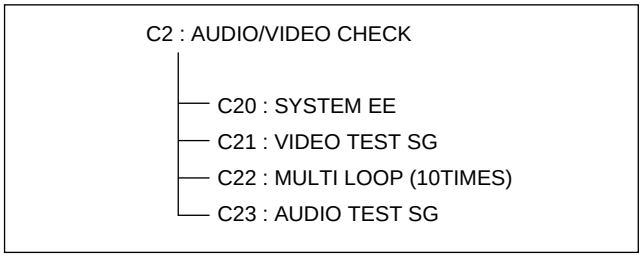
If no trouble is found on the played back tape

The possible cause below are considered.

- Heads clogging
  ⇨ Perform steps (1) to (5) of “For Condition NG” on previously described.
- Servo system adjustment defect or circuit defect
  ⇨ Readjust the servo system. (A00-01 : SERVO ADJUST)
  ⇨ Check the servo system. (C03 : REEL/CAPSTAN MOTOR & FG CHECK)
- Brush/slip ring assembly defect or its part installation/ connection defect
  ⇨ Replace or reinstall the brush/slip ring assembly. (Refer to Section 5-4.)
- Harness (between EQ-75 board and drum assembly) connection defect
- EQ-75 board defect
- Drum assembly defect

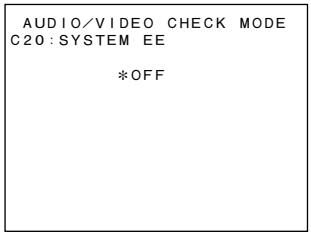
3-2-4. AUDIO/VIDEO CHECK Mode (C2)

The C2 : AUDIO/VIDEO CHECK mode has four menus that are useful for checking audio and video systems.



Menu Tree of Audio/Video Systems Check Mode

C20 : SYSTEM EE



This menu selects the system E-E function to be enabled or disable in the maintenance mode, and additionally selects a signal path from among the followings when the system E-E function is enabled.

OFF: Normal state (in which the system E-E state is not entered)
ECC-EE: Reflects the signal after it passes through IC402 (ECC encoder) on the DPR-118 board.
RF-EE: Reflects a signal in the EQ-75 board.

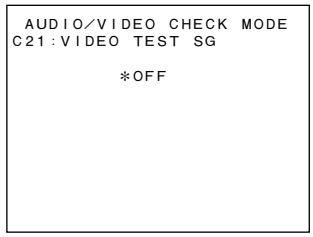
System E-E setting

To set the system E-E function, turn the search dial while pressing the JOG button and display the desired setting.
The specified setting is maintained until the maintenance mode is terminated or the setting is changed.

Notes

- This menu is set to OFF when the maintenance mode is activated.
- Be sure to perform under the no cassette tape state when selecting the system E-E to enable:

C21 : VIDEO TEST SG



This menu selects the operation in the maintenance mode of a video test signal generator incorporated into this unit.

OFF: The video test signal generator operation stops.
Except OFF: A video test signal generator outputs the selected signals (below).

100% color bars	75% color bars
75% reverse color bars	
Bowtie	Pulse and bar
Multi-burst	H sweep
5-step	Ramp
Shallow ramp	Red signal
50% flat	100% flat
Black burst	
Pathological check code	
NTC7 (NTSC) ⇦ Only for 525/60 system	
Line330 (625) ⇦ Only for 625/50 system	

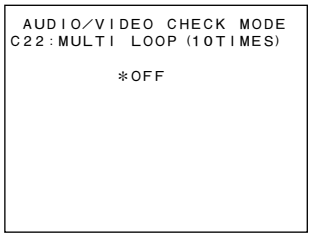
Setting of video test signal generator

To set the video test signal generator, turn the search dial while pressing the JOG button and display the desired setting.
This setting is valid until the maintenance mode is terminated. However, the C21 : VIDEO TEST SG setting is reset to OFF when the C22 : MULTI LOOP (10TIMES) setting is changed.

Notes

- This menu is set to OFF when the maintenance mode is activated.
- The output signal of a test signal generator can also be recorded on the tape. In this case, press the SET button and perform the recording operation with the white square is displayed in the upper-right position of the superimpose picture.

C22 : MULTI LOOP (10TIMES)



This menu selects the multi-loop function enabled or disabled in the maintenance mode, and additionally selects a video test signal when the multi-loop function is enabled. The video test signal that can be selected is output from an internal video test signal generator. The video test signal is the same in type as one described in a C21 : VIDEO TEST SG menu.

OFF: Normal state (in which no multi-loop operation is performed)
Except OFF: The selected signal is output from a video test signal generator for multi-loop operation.

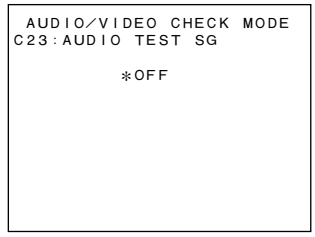
Multi-loop function setting

To set the multi-loop function, turn the search dial while pressing the JOG button and display the desired setting. This setting is valid until the maintenance mode is terminated. However, the C22 : MULTI LOOP (10TIMES) setting is reset to OFF when the C21 : VIDEO TEST SG setting is changed.

Notes

- This menu is set to OFF when the maintenance mode is activated.
- The output signal during multi-loop operation can also be recorded on the tape. In this case, press the SET button and perform the recording operation with the white square is displayed in the upper-right position of the superimpose picture.

C23 : AUDIO TEST SG



This menu selects the operation in the maintenance mode of an audio test signal generator incorporated in this unit.

OFF: The audio test signal generator operation stops.
Except OFF: An audio test signal generator outputs the selected signals (below).
Silence
1 kHz sine 0 VU
1 kHz sine burst/1 field
1 kHz sine burst/2 field
1 kHz sine burst/5 field
1 kHz sine burst/8 field
1 kHz sine burst(10)
4 kHz sine burst(40)
Saw wave

Setting of audio test signal generator

To set the audio test signal generator, turn the search dial while pressing the JOG button and display the desired setting.
This setting is valid until the maintenance mode is terminated.

Notes

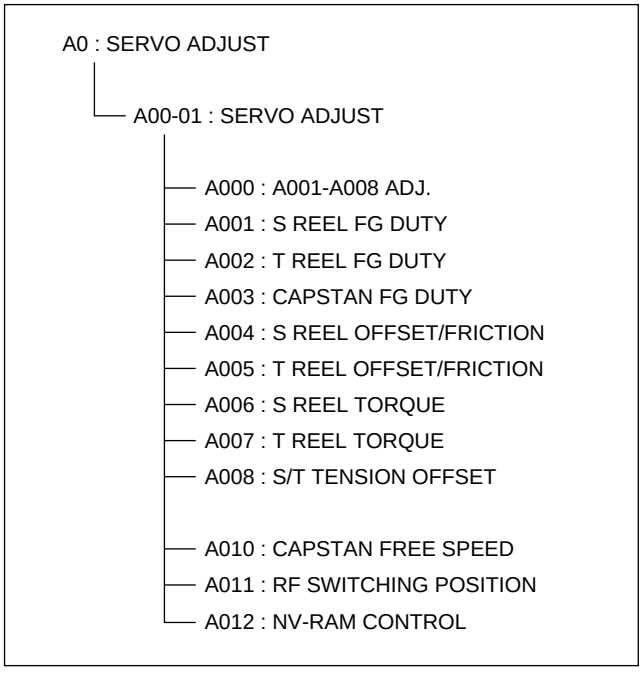
- This menu is set to OFF when the maintenance mode is activated.
- The output signal of a test signal generator can also be recorded on the tape. In this case, press the SET button and perform the recording operation with the white square is displayed in the upper-right position of the superimpose picture.

3-2-5. SERVO ADJUST Mode (A00-01)

The A00-01 : SERVO ADJUST menu is used to adjust the servo system.

Note

In the SERVO ADJUST mode, only the menu number is displayed in a time data display area. (A00-01 is displayed as A00.)

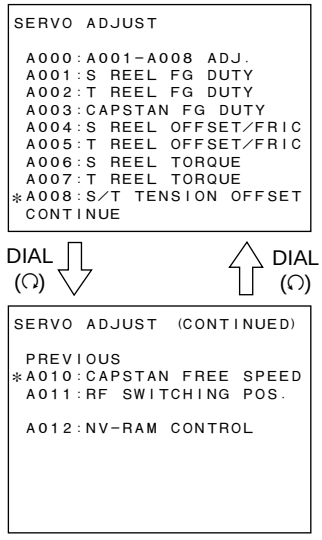

A0 : SERVO ADJUST
A00-01 : SERVO ADJUST
A000 : A001-A008 ADJ.
A001 : S REEL FG DUTY
A002 : T REEL FG DUTY
A003 : CAPSTAN FG DUTY
A004 : S REEL OFFSET/FRICTION
A005 : T REEL OFFSET/FRICTION
A006 : S REEL TORQUE
A007 : T REEL TORQUE
A008 : S/T TENSION OFFSET
A010 : CAPSTAN FREE SPEED
A011 : RF SWITCHING POSITION
A012 : NV-RAM CONTROL

Note

The cassette tape is automatically ejected when the A00-01 : SERVO ADJUST menu is shifted to the lower-level menu with the cassette tape inserted into this unit.

A00-01 : SERVO ADJUST

In the A00-01 : SERVO ADJUST menu, the whole menu cannot be displayed on the superimpose picture at a time. Therefore, the display is divided into the menu selection screen of A000 to A008 and the menu selection screen of A010 and later. The menu selection screen is automatically switched when the search dial is turned.



Note

The menu title of A010 may be displayed as “CAPSTAN SPEED”.

A000 : A001-A008 ADJ.

This menu is used to execute the adjustment menus below automatically and continuously.

A001 : S REEL FG DUTY
A002 : T REEL FG DUTY
A003 : CAPSTAN FG DUTY
A004 : S REEL OFFSET/FRICTION
A005 : T REEL OFFSET/FRICTION
A006 : S REEL TORQUE
A007 : T REEL TORQUE
A008 : S/T TENSION OFFSET

To execute the adjustment menus

(1) Press the SET button.
- The automatic adjustment is initiated when the SET button is pressed.
  The execution time is about 150 seconds.
- The adjustment menu name in execution and message “ADJUSTING.....” are displayed on the superimpose picture during automatic adjustment. Only the menu number is displayed in a time data display area.
- Message “ADJUST COMPLETE” is momentarily displayed on the superimpose picture when each adjustment menu is completed normally.
  Message “# ADJUST INCOMPLETE #” is displayed on the superimpose picture when no adjustment can be performed. The automatic adjustment is then interrupted. Refer to the “For Automatic Adjustment Failure” on page 3-45 when this message is displayed.

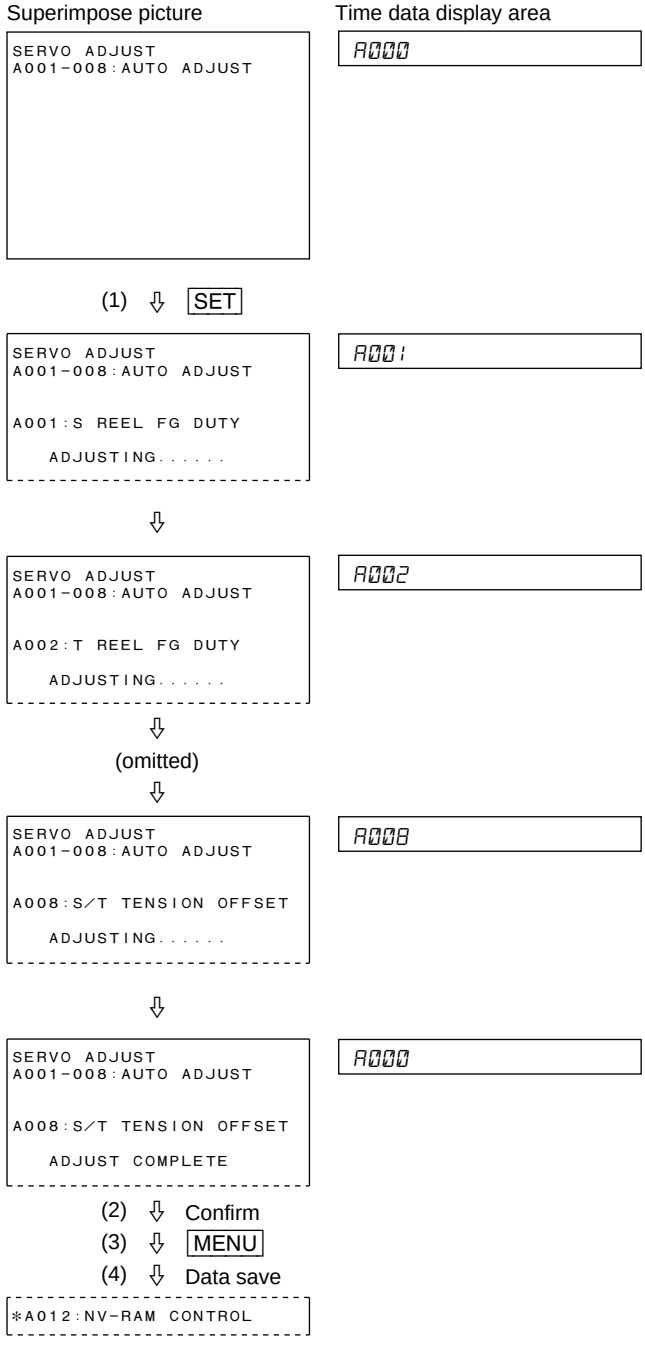
(2) Confirm the adjustment result.
- Message “ADJUST COMPLETE” remains displayed on the superimpose picture when all adjustments are completed normally.

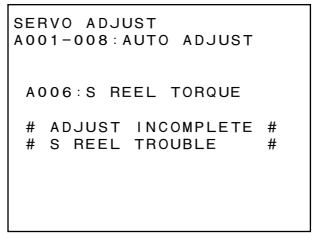
(3) Press the MENU button to terminate the menu.

(4) To save the adjustment data in the NV-RAM of a servo system, execute the SAVE SERVO ADJUST data in an A012 : NV-RAM CONTROL menu.

Example of display and operation

Example of A001 : S REEL FG DUTY





Ex.: When failing the automatic adjustment

A001 : S REEL FG DUTY
A002 : T REEL FG DUTY
A003 : CAPSTAN FG DUTY
A004 : S REEL OFFSET/FRICTION
A005 : T REEL OFFSET/FRICTION
A006 : S REEL TORQUE
A007 : T REEL TORQUE
A008 : S/T TENSION OFFSET

These menus are used to perform the automatic adjustments below.

A001 : S reel FG duty adjustment
A002 : T reel FG duty adjustment
A003 : Capstan FG duty adjustment
A004 : S reel offset/friction adjustment
A005 : T reel offset/friction adjustment
A006 : S reel torque adjustment
A007 : T reel torque adjustment
A008 : S/T tension offset adjustment

To execute the automatic adjustments

(1) Press the SET button.
- The automatic adjustment is initiated when the SET button is pressed.
  The execution time is about 15 seconds for A001 to A003 and about 20 seconds for others.
- Message “ADJUSTING.....” is displayed on only the superimpose picture during automatic adjustment.

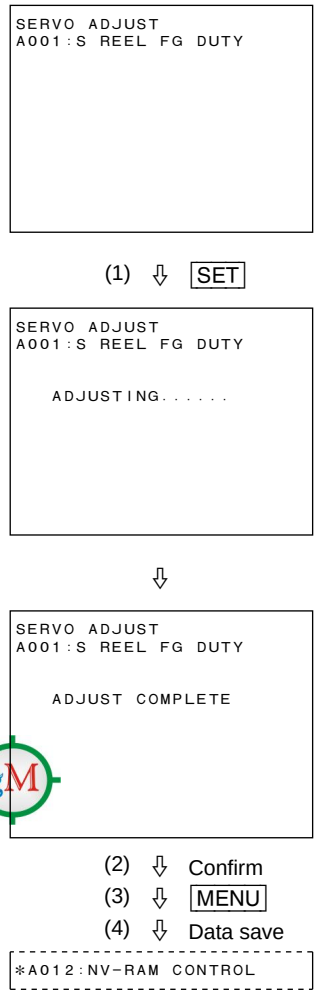
(2) Confirm the adjustment result.
- Message “ADJUST COMPLETE” is displayed on the superimpose picture when the automatic adjustment is completed normally.
- Message “# ADJUST INCOMPLETE #” is displayed on the superimpose picture when no adjustment can be performed. The automatic adjustment is then interrupted. Refer to the “For Automatic Adjustment Failure” on page 3-45 when this message is displayed.

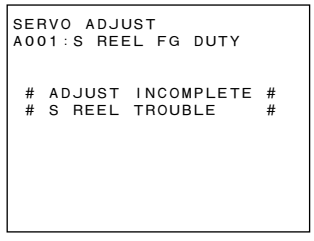
(3) Press the MENU button to terminate the menu.

(4) To save the adjustment data in the NV-RAM of a servo system, execute the SAVE SERVO ADJUST data in an A012 : NV-RAM CONTROL menu.

Example of display and operation

Example of A001 : S REEL FG DUTY





Ex.: When failing the automatic adjustment

A010 : CAPSTAN FREE SPEED

This menu is used to perform the automatic adjustment of a capstan free speed.

To execute the automatic adjustment

Note

It is required to perform this adjustment for the 525/60 system and 625/50 system.

(1) Insert the following alignment tape.
For 525/60 system: SR2-1
For 625/50 system: SR2-1P
- The adjustment is initiated when an alignment tape is inserted.
- Message “ADJUSTING.....” is displayed on only the superimpose picture during automatic adjustment.

Notes

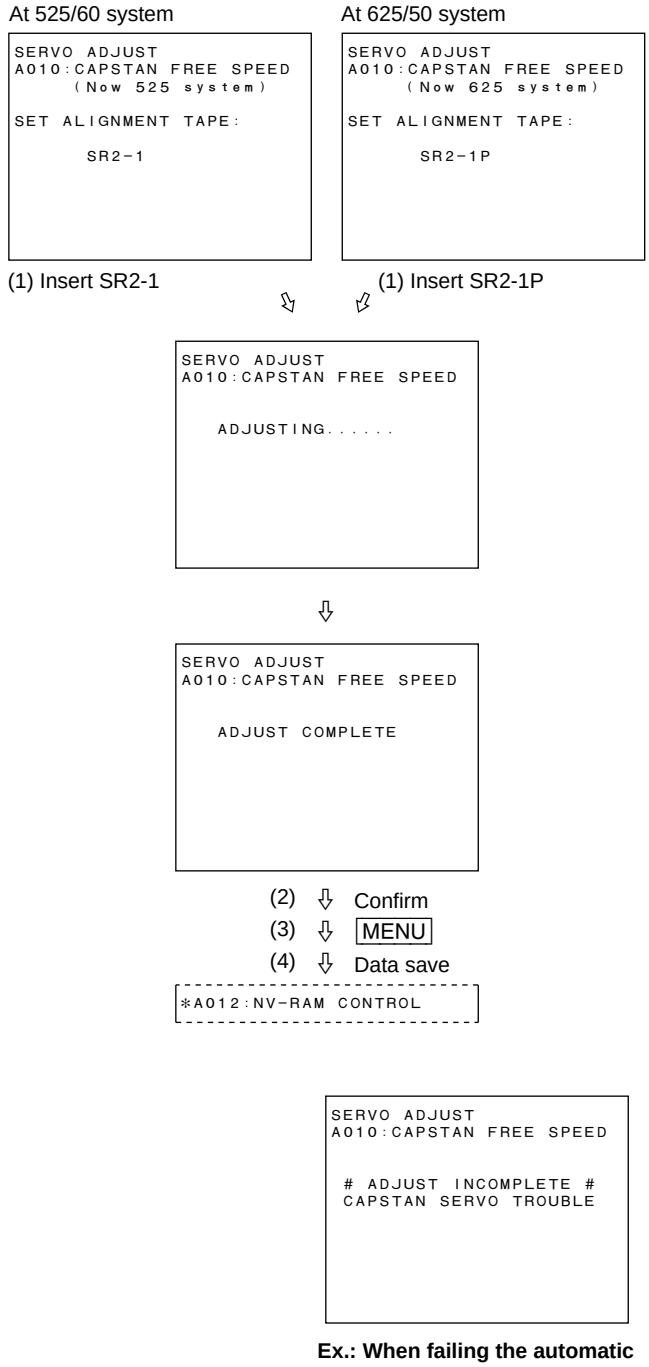
- Be sure to use the specified alignment tape.
If the specified cassette tape is not used, the adjustment cannot be properly performed even if message “ADJUST COMPLETE” is displayed after it is completed.
- The tape amount on the portion that can be played back after an alignment tape is inserted must exceed the adjustment execution time.
The adjustment execution time is usually about 15 seconds.

(2) Confirm the adjustment result.
- Message “ADJUST COMPLETE” is displayed on the superimpose picture when the automatic adjustment is completed normally.
An alignment tape is ejected automatically.
- Message “# ADJUST INCOMPLETE #” is displayed on the superimpose picture when no adjustment can be performed. The automatic adjustment is then interrupted. Refer to the “For Automatic Adjustment Failure” on page 3-45 when this message is displayed.

(3) Press the MENU button to terminate the menu.

(4) To save the adjustment data in the NV-RAM of a servo system, execute the SAVE SERVO ADJUST data in an A012 : NV-RAM CONTROL menu.

Example of display and operation



Ex.: When failing the automatic adjustment

A011 : RF SWITCHING POS.

This menu is used to adjust the RF switching position automatically or manually. Only the automatic adjustment is described below.

To execute the automatic adjustment

Note

Adjust on 525/60 or 625/50 system. If the adjustment is performed by one of system, the other is updated automatically.
Alignment tape SR2-1 (for a 525/60 system) or SR2-1P (for a 625/50 system) located on the beginning of time code 00:25:00:00 in advance is required for this adjustment.
If the specified cassette tape is not used, the adjustment cannot be properly performed even if message "ADJUST COMPLETE" is displayed after it is completed.

(1) Confirm that an ∗ mark is assigned to the "AUTO" display on the superimpose picture and press the SET button.
- If the ∗ mark is assigned to the "MANUAL" display, turn the search dial and move the mark to the "AUTO" display.
- In a time data display area, the automatic adjustment (AUTO) is displayed as "A0110", and the manual adjustment (MANUAL) is displayed as "A0111".

(2) Insert alignment tape SR2-1 (for a 525/60 system) or SR2-1P (for a 626/50 system) located in the beginning of time code 00:25:00:00.
- The adjustment is initiated when an alignment tape is inserted.
- Message "ADJUSTING....." is displayed on only the superimpose picture during automatic adjustment.

(3) Confirm the adjustment result.
- Message "ADJUST COMPLETE" is displayed on the superimpose picture when the automatic adjustment is completed normally.
  An alignment tape is ejected automatically.
- Message "# ADJUST INCOMPLETE #" is displayed on the superimpose picture when no adjustment can be performed. The automatic adjustment is then interrupted. Refer to the "For Automatic Adjustment Failure" on page 3-45 when this message is displayed.

(4) Press the MENU button to terminate the menu.

(5) To save the adjustment data in the NV-RAM of a servo system, execute the SAVE SERVO ADJUST DATA in an A012 : NV-RAM CONTROL menu.

Example of display and operation

Superimpose picture / Time data display area

```
SERVO ADJUST
A011:RF SWITCHING POS.

∗AUTO
 MANUAL

    PG DATA:BDF5
```
A0110

(1) ⇩ [SET]

```
SERVO ADJUST
A011:RF SWITCHING POS.

 SET
 SR2-1
 ALIGNMENT TAPE
 TC 00:25:00:00

    PG DATA:C000
```
A011

(2) ⇩ Insert SR2-1/SR2-1P

```
SERVO ADJUST
A011:RF SWITCHING POS.

   ADJUSTING.....

    PG DATA:BFFF
```
A011

⇩

```
SERVO ADJUST
A011:RF SWITCHING POS.

   ADJUST COMPLETE

    PG DATA:BDF7
```
A011

(3) ⇩ Confirm
(4) ⇩ [MENU]
(5) ⇩ Data save

```
∗A012:NV-RAM CONTROL
```

```
SERVO ADJUST
A011:RF SWITCHING POS.

 # ADJUST INCOMPLETE #

    PG DATA:C000
```

When failing the automatic adjustment

For Automatic Adjustment Failure

The circuit in which failure occurred can be traced to some degree by the trouble message displayed together when message "# ADJUST INCOMPLETE #" is displayed during execution of adjustment menus A000 to A011.

Note

The trouble message display indicates that no adjustment could be performed because the circuit described in this manual did not operate normally. Moreover, other circuits (e.g., control signal system) in which failure actually occurred may also exist.

A000 : A000-A008 ADJUST

Refer to the description of A001 to A008.

A001 : S REEL FG DUTY

When "S REEL FG AMP TROUBLE" is displayed

⇨ Check the S reel FG amplifier circuit on the MS-58 board.

When "S REEL DRIVER TROUBLE" is displayed

⇨ Check the S reel motor driver circuit on the DR-315 board.

A002 : T REEL FG DUTY

When "T REEL FG AMP TROUBLE" is displayed

⇨ Check the T reel FG amplifier circuit on the MS-58 board.

When "T REEL DRIVER TROUBLE" is displayed

⇨ Check the T reel motor driver circuit on the DR-315 board.

A003 : CAPSTAN FG DUTY

When "CAPSTAN FG AMP TROUBLE" is displayed

⇨ Check the capstan FG amplifier circuit on the MS-58 board.

⇨ Check the capstan motor driver circuit on the DR-315 board.

A004 : S REEL OFFSET/FRICTION
A006 : S REEL TORQUE

"# S REEL TROUBLE #" is displayed in these menus.

⇨ Execute the S reel FG duty adjustment (A001 : S REEL FG DUTY) again.

⇨ Check the S reel motor driver circuit on the DR-315 board.

A005 : T REEL OFFSET/FRICTION
A007 : T REEL TORQUE

"# T REEL TROUBLE #" is displayed in these menus.

⇨ Execute the T reel FG duty adjustment (A002 : T REEL FG DUTY) again.

⇨ Check the T reel motor driver circuit on the DR-315 board.

A008 : S/T TENSION OFFSET

When "S REEL DRIVER TROUBLE" is displayed

⇨ Check the S tension detection circuit on the MS-58 board.

⇨ Check the S reel motor driver circuit on the DR-315 board.

When "T REEL DRIVER TROUBLE" is displayed

⇨ Check the T tension detection circuit on the MS-58 board.

⇨ Check the T reel motor driver circuit on the DR-315 board.

A010 : CAPSTAN FREE SPEED

Confirm whether the played back tape is alignment tape SR2-1 (for 525/60 system) and SR2-1P (for 625/50 system).

When "CAPSTAN SERVO TROUBLE" is displayed

⇨ Execute the capstan FG duty adjustment (A003 : CAPSTAN FG DUTY) again.

⇨ Check the capstan FG amplifier circuit and CTL amplifier circuit on the MS-58 board.

When "CAPSTAN DRIVER TROUBLE" is displayed

⇨ Check the capstan motor driver circuit on the DR-315 board.

A011 : RF SWITCHING POS.

Confirm whether the played back tape is alignment tape SR2-1 (for a 525/60 system) or SR2-1P (for a 625/50 system).

A012 : NV-RAM CONTROL

The A012 : NV-RAM CONTROL menu is used to save the servo adjustment data adjusted in the SERVO ADJUST mode in the NV-RAM of a servo system.

CAUTION

Do not save the adjustment data in NV-RAM when abnormality is found during automatic adjustment (when "# ADJUST INCOMPLETE #" is displayed).

Note

When adjustment data was not stored in this menu, it returns to the state before adjustment if the power is turned off.

To execute the data save

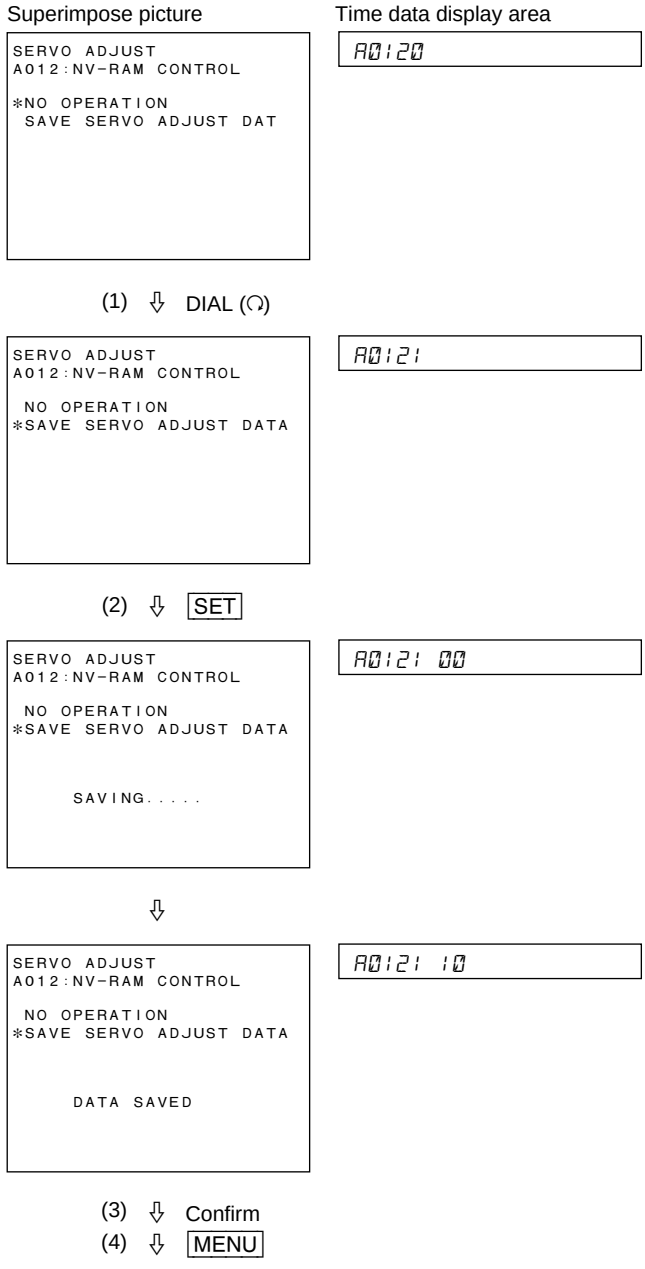
(1) Turn the search dial and move the ∗ mark to "SAVE SERVO ADJUST DATA" on the superimpose picture.
- In a time data display area, NO OPERATION is displayed as "A0120", and SAVE SERVO ADJUST DATA is displayed as "A0121".

(2) Press the SET button.
- The data transmission is initiated when the SET button is pressed. The data transmission time is about ten seconds.
- Message "SAVING....." is displayed on the superimpose picture, and "A0121 00" is displayed in the time data display area.

(3) Confirm that the data transmission is completed.
- After the data transmission is completed, message "DATA SAVED" is displayed on the superimpose picture and "A0121 10" is displayed in the time data display area.

(4) Press the MENU button to terminate the menu.

Example of display and operation



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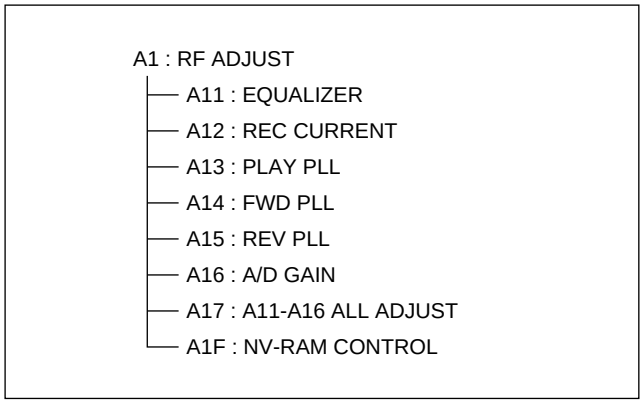
3-2-6. RF ADJUST Mode (A1)

The A1 : RF ADJUST mode is used to adjust the RF system.
Eight menus are available.


A1 : RF ADJUST
A11 : EQUALIZER
A12 : REC CURRENT
A13 : PLAY PLL
A14 : FWD PLL
A15 : REV PLL
A16 : A/D GAIN
A17 : A11-A16 ALL ADJUST
A1F : NV-RAM CONTROL

Menu Tree of RF System Adjustment Mode

Note

If abnormality exists in the servo system, each menu in A1 : RF ADJUST does not function normally.

A11 : EQUALIZER
A12 : REC CURRENT
A13 : PLAY PLL
A14 : FWD PLL
A15 : REV PLL
A16 : A/D GAIN

These menus are used to perform the automatic adjustments below.

A11 : EQUALIZER

These menus automatically adjust the PB head PB levels (VC) for A1, A2, A5, A6, B1, B2, B5, B6, CNFA, and CNFB channels, and the gain (EQ) and phase (PH) of a PB equalizer.

A12 : REC CURRENT

This menu automatically adjusts the recording current levels for the REC heads (channels A and B).

A13 : PLAY PLL

This menu automatically adjusts the VCO free-running frequency in a PB PLL circuit for PLAY mode.

A14 : FWD PLL

This menu automatically adjusts the VCO free-running frequency in a PB PLL circuit for F FWD mode.

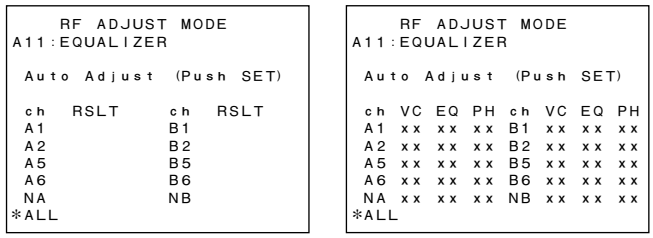
A15 : REV PLL

This menu automatically adjusts the VCO free-running frequency in a PB PLL circuit for REV mode.

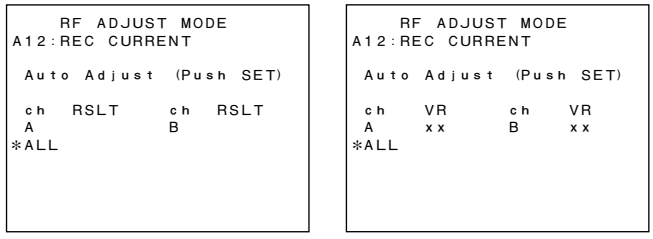
A16 : A/D GAIN

This menu automatically adjusts the gain when a PB RF signal is converted from analog to digital.

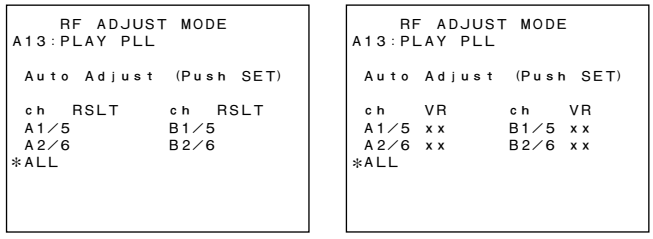
Right side display is an example of the adjustment data during the STOP button is pressed.
Actually, adjustment data is displayed at the “xx” portion.


RF ADJUST MODE
A11:EQUALIZER
Auto Adjust (Push SET)
ch RSLT ch RSLT
A1 B1
A2 B2
A5 B5
A6 B6
NA NB
*ALL
RF ADJUST MODE
A11:EQUALIZER
Auto Adjust (Push SET)
ch VC EQ PH ch VC EQ PH
A1 xx xx xx B1 xx xx xx
A2 xx xx xx B2 xx xx xx
A5 xx xx xx B5 xx xx xx
A6 xx xx xx B6 xx xx xx
NA xx xx xx NB xx xx xx
*ALL

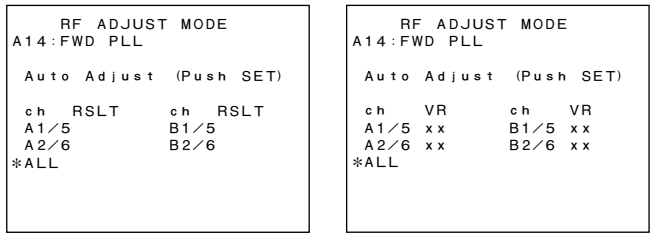
A11 : EQUALIZER



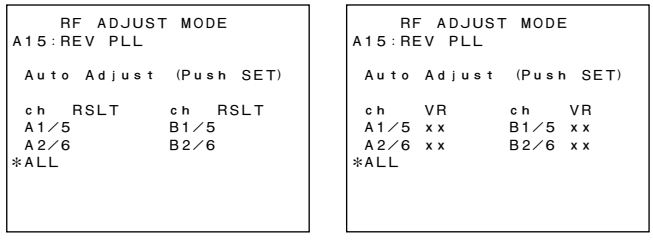
A12 : REC CURRENT



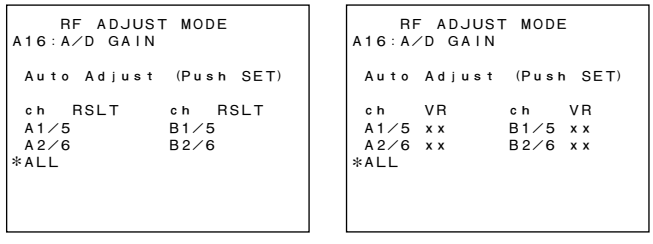
A13 : PLAY PLL



A14 : FWD PLL

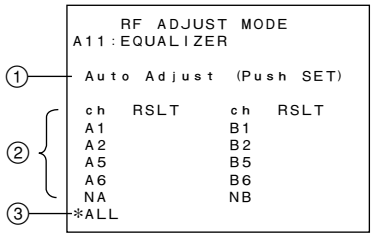


A15 : REV PLL



A16 : A/D GAIN

Description of superimpose picture



Ex. A11 : EQUALIZER

① The display in this line changes. Each display and its meaning are described below.

Auto Adjust(Push SET) :	Press the SET button to initiate the automatic adjustment.
Insert SR5-1 :	Insert an alignment tape.
Insert Blank Tape :	Insert the tape on which recording is possible.
Auto Tracking ... :	Tracking is in an optimization process.
Auto Adjusting ... :	Automatic adjustment is in progress.
Auto Adjust Complete :	Automatic adjustment is completed.
Auto Adjust Failure :	Automatic adjustment failure
Condition NG :	Error condition NG

② To perform the automatic adjustment for each channel (circuit), select using an * mark.
The adjustment result (OK, NG, or FAIL) is displayed on the right of the channel name. "OK" is displayed if the adjustment can be performed normally. "NG" is displayed if the error condition is bad. "FAIL" is displayed if the automatic adjustment fails.

Notes

- "RSLT" indicates the result.
- "NA", "NB" indicate CNFA, CNFB.

The adjustment data in each channel (circuit) is displayed while the STOP button is pressed during except adjustment.

Note

Do not press the STOP button during adjustment. The tape stops and the adjustment becomes impossible.

③ To perform the automatic adjustment in all channels (circuits) at a time, select ALL.
After the automatic adjustment in all channels (circuits) is completed, "OK" is displayed on the right of ALL if all channels (circuits) are OK. If there is one channel in which NG or failure occurs, "NG" or "FAIL" is displayed on the right of ALL. If both NG and failure occur in channels, "FAIL" is displayed.

To execute the adjustment

(1) Insert the specified cassette tape.

Notes

- If the specified cassette tape is not used, the adjustment cannot be properly performed even if message "Auto Adjust Complete" is displayed after it is completed. In an A12 : REC CURRENT menu, insert the tape that can be recorded based on a Betacam SX format. In other menus, insert alignment tape SR5-1 (a 525/60 system) or SR5-1P (for a 625/50 system).
- Execute an A12 : REC CURRENT menu with the REC INHIBIT indicator turned off. The cassette tape is ejected when this indicator lights.
  This indicator lights when the REC inhibit plug on the cassette tape is pushed or when the REC INHIBIT switch on the subcontrol panel is set to ON.
- Take care that the tape transport mode does not change during automatic adjustment.
  Any adjustment cannot be properly performed in modes other than tape transport that was set automatically. Moreover, in modes other than tape transport, the automatic adjustment cannot be performed any longer or "FAIL" or "NG" is displayed as the adjustment result. Therefore, pay attention to the transport start position of the tape so that the end and beginning of the tape are not detected during adjustment. The minimum tape amount required for normal automatic adjustment is shown in the table on the next page. However, the tape amount increases or decreases when abnormality occurs.

Menu	Ordinary adjustment time	Tape amount required (Transport mode)
A11 : EQUALIZER Ⓣ	About 2 min./ALL, about 15 sec./channel	Adjustment time (PLAY)
A12 : REC CURRENT Ⓣ	About 7 sec./ALL, about 3 sec./channel	Adjustment time (REC)
A13 : PLAY PLL	About 12 sec./ALL, about 10 sec./circuit	Adjustment time (PLAY)
A14 : FWD PLL	About 10 sec.	About 10 min. (F FWD)
A15 : REV PLL	About 10 sec.	About 11 min. (REV)
A16 : A/D GAIN Ⓣ	About 90 sec./ALL, about 10 sec./circuit	Adjustment time (PLAY)

In a menu with Ⓣ, tracking operation is performed.

(2) Turn the search dial and move the ∗ mark to the channel to be adjusted or ALL.
- Usually, select ALL.

(3) Press the SET button.
- The tape runs automatically and the automatic adjustment is initiated.
- Message “Auto Tracking...” (only a menu in which tracking operation is performed) or “Adjusting...” is displayed on the superimpose picture.

Note

When ALL adjustment is performed in the menu in which tracking operation is carried out, the adjustment result of the channel is displayed every time one-channel (circuit) adjustment is completed.
- The time data display area displays an ordinary time counter.
- To cancel the automatic adjustment, press the MENU button.
- Message “Insert SR5-1” or “Insert Blank Tape” is displayed on the superimpose picture when no cassette tape is inserted.
  When a cassette tape is inserted, the tape runs automatically and the automatic adjustment is initiated.

Notes

- If message “Auto Adjust (Push SET)” is continuously displayed on the superimpose picture with the automatic adjustment initiated (the SET button pressed), the non-recorded portion on the tape is judged to be played back from the beginning. Change the playback position on the tape (not including an A12 : REC CURRENT menu).
- Do not touch the button or search dial, during automatic adjustment, that influences the tape transport.
  Any adjustment cannot be properly performed when the tape transport state is changed. In this case, the automatic adjustment cannot be performed any longer or “FAIL” or “NG” is displayed as the adjustment result.

(4) Confirm the result of automatic adjustment on the superimpose picture.
- If no abnormality is found, “OK” is displayed on the right of the selected channel (circuit).
- Refer to the “For Condition NG/Automatic Adjustment Failure” on page 3-54 when “Condition NG” or “Auto Adjust Failure” is displayed on the superimpose picture.
- To confirm the adjustment data, press the STOP button.

Note

“OK”, “NG”, or “FAIL” is displayed in a time data display area.
The adjustment result for each channel (circuit) is displayed when the search dial is turned after ALL adjustment is completed.

(5) To terminate the menu, press the MENU button.
To execute the automatic adjustment again in this menu, return to step (2).

(6) To save the adjustment data in NV-RAM, execute SAVE ALL ADJUST DATA in an A1F : NV-RAM CONTROL menu.
To return the adjustment data to the state before adjustment, execute ALL DATA PREVIOUS in an A1F : NV-RAM CONTROL menu.

Note

Do not save the adjustment data in NV-RAM when abnormality is found during automatic adjustment (message “Auto Adjust Failure” or “Condition NG” is displayed).

Example of display and operation

Ex.: ALL is selected in A11 : EQUALIZER

```
    RF ADJUST MODE
A11:EQUALIZER

 Auto Adjust  (Push SET)

 ch   RSLT     ch   RSLT
 A1            B1
 A2            B2
 A5            B5
 A6            B6
 NA            NB
*ALL
```

(1) ⇩ Insert SR5-1/SR5-1P
(2) ⇩ Select
(3) ⇩ SET

```
    RF ADJUST MODE
A11:EQUALIZER

 Auto Tracking ...

 ch   RSLT     ch   RSLT
 A1            B1
 A2            B2
 A5            B5
 A6            B6
 NA            NB
*ALL
```

⇩

```
    RF ADJUST MODE
A11:EQUALIZER

 Auto Adjusting .......

 ch   RSLT     ch   RSLT
 A1            B1
 A2            B2
 A5            B5
 A6            B6
 NA            NB
*ALL
```

⇩

```
    RF ADJUST MODE
A11:EQUALIZER

 Auto Adjust Complete

 ch   RSLT     ch   RSLT
 A1    OK      B1
 A2            B2
 A5            B5
 A6            B6
 NA            NB
*ALL
```

⇩
(omitted)
⇩

```
    RF ADJUST MODE
A11:EQUALIZER

 Auto Adjust Complete

 ch   RSLT     ch   RSLT
 A1    OK      B1    OK
 A2    OK      B2    OK
 A5    OK      B5    OK
 A6    OK      B6    OK
 NA    OK      NB    OK
*ALL   OK
```

(4) ⇩ Confirm
(5) ⇩ MENU
(6) ⇩ Data save

```
*A1F:NV-RAM CONTROL
```

Ex.: ALL is elected in A12 : REC CURRENT.

```
    RF ADJUST MODE
A12:REC CURRENT

 Auto Adjust  (Push SET)

 ch   RSLT     ch   RSLT
 A             B
*ALL
```

(1) ⇩ Insert a recording tape
(2) ⇩ Select
(3) ⇩ SET

```
    RF ADJUST MODE
A12:REC CURRENT

 Auto Adjusting .......

 ch   RSLT     ch   RSLT
 A             B
*ALL
```

⇩

```
    RF ADJUST MODE
A12:REC CURRENT

 Auto Adjust Complete

 ch   RSLT     ch   RSLT
 A     OK      B
*ALL
```

⇩

```
    RF ADJUST MODE
A12:REC CURRENT

 Auto Adjusting .......

 ch   RSLT     ch   RSLT
 A     OK      B
*ALL
```

⇩

```
    RF ADJUST MODE
A12:REC CURRENT

 Auto Adjust Complete

 ch   RSLT     ch   RSLT
 A     OK      B     OK
*ALL   OK
```

(4) ⇩ Confirm
(5) ⇩ MENU
(6) ⇩ Data save

```
*A1F:NV-RAM CONTROL
```

Ex.: ALL is selected in A13 : PLAY PLL

```
    RF ADJUST MODE
A13:PLAY PLL

 Auto Adjust  (Push SET)

 ch   RSLT     ch   RSLT
 A1/5          B1/5
 A2/6          B2/6
*ALL
```

(1) ⇩ Insert SR5-1/SR5-1P
(2) ⇩ Select
(3) ⇩ SET

```
    RF ADJUST MODE
A13:PLAY PLL

 Auto Adjusting

 ch   RSLT     ch   RSLT
 A1/5          B1/5
 A2/6          B2/6
*ALL
```

⇩

```
    RF ADJUST MODE
A13:PLAY PLL

 Auto Adjust  (Push SET)

 ch   RSLT     ch   RSLT
 A1/5 OK       B1/5 OK
 A2/6 OK       B2/6 OK
*ALL   OK
```

(4) ⇩ Confirm
(5) ⇩ MENU
(6) ⇩ Data save

```
*A1F:NV-RAM CONTROL
```

A17 : A11-A16 ALL ADJUST

These menus execute the automatic adjustment of A11 to A16 described previously in the following order.

A13: PLAY PLL
A16: A/D GAIN
A11: EQUALIZER
A14: FWD PLL
A15: REV PLL
A12: REC CURRENT

To execute the automatic adjustment

(1) Insert alignment tape SR5-1 (for a 525/60 system) or SR5-1P (for a 625/50 system) that was rewound to the beginning of the tape.

Note

Be sure to use the specified alignment tape.
If the specified cassette tape is not used, the adjustment cannot be performed properly.

(2) Press the SET button.
- The automatic adjustment in a PB system is initiated when the SET button is pressed.
- The superimpose picture during adjustment is displayed in the same way as when the adjustment is executed independently. If message “Condition NG” or “Auto Adjust Failure” is not displayed, the adjustment in a PB system is completed after about 5 to 6 seconds.
  The alignment tape is rewound when the adjustment is completed. Message “Set a blank tape and push SET button for REC CURRENT adjustment” is displayed on the superimpose picture.

(3) Eject the alignment tape.
(4) Insert the cassette tape on which recording is possible.
(5) Press the SET button.
- The automatic adjustment (A12 : REC CURRENT) in a REC system is initiated when the SET button is pressed.
- The superimpose picture during adjustment is displayed in the same way as when the adjustment is executed independently. If message “Condition NG” or “Auto Adjust Failure” is not displayed, the adjustment in a REC system is completed after several seconds.

(6) Confirm that message “Auto Adjust Complete” is displayed on the superimpose picture.
- Confirm the adjustment data from each menu.

Note

If abnormality exists during adjustment, message “Condition NG” or “Auto Adjust Failure” is displayed on the superimpose picture in the same way as when the adjustment is executed independently. The automatic adjustment stops in the adjustment menu. Message “A17-ALL FAIL” or “A17-ALL NG” is displayed in a time data display area.
- Refer to the “For Condition NG/Automatic Adjustment Failure” on page 3-54 when message “Condition NG” or “Auto Adjust Failure” is displayed.
- To confirm the adjustment data, press the STOP button.

(7) Press the MENU button.
- To execute readjustment, press the MENU button. Select again once the menu is completed.

(8) To save the adjustment data in NV-RAM, execute SAVE ALL ADJUST DATA in an A1F : NV-RAM CONTROL menu.
To return the adjustment data to the state before adjustment, execute ALL DATA PREVIOUS in an A1F : NV-RAM CONTROL menu.

Note

Do not save the adjustment data in NV-RAM when abnormality is found during automatic adjustment (when message “Auto Adjust Failure” or “Condition NG” is displayed).

Example of display and operation

Superimpose picture

```
RF ADJUST MODE
A17:A11-A16 ALL ADJUST

 Auto Adjust (Push SET)
```

Time data display area

```
A17-PUSH SET BTN
```

(1) ⇩ Insert SR5-1/SR5-1P
(2) ⇩ [SET]

```
    RF ADJUST MODE      □
A17:A11-A16 ALL ADJUST
 A13:PLAY PLL
 Auto Adjusting

 ch  RSLT    ch  RSLT
 A1/5        B1/5
 A2/6        B2/6
*ALL
```

⇩
(omitted)
⇩

```
    RF ADJUST MODE      □
A17:A11-A16 ALL ADJUST
 A16:A/D GAIN
 Auto Adjusting

 ch  RSLT    ch  RSLT
 A1/5        B1/5
 A2/6        B2/6
*ALL
```

⇩
(omitted)
⇩

```
    RF ADJUST MODE      □
A17:A10-A16 ALL ADJUST
 A11:EQUALIZER
 Auto Adjusting

 ch  RSLT    ch  RSLT
 A1          B1
 A2          B2
 A5          B5
 A6          B6
 NA          NB
*ALL
```

⇩
(omitted)
⇩
(continue)

(continued)
⇩

```
    RF ADJUST MODE      □
A17:A11-A16 ALL ADJUST

 Set a blank tape and
 push SET button for
 REC CURRENT adjustment.
```

(3) ⇩ [EJECT]
(4) ⇩ Insert a recording tape
(5) ⇩ [SET]

```
    RF ADJUST MODE      □
A17:A11-A16 ALL ADJUST
 A12:REC CURRENT
 Auto Adjusting

 ch  RSLT    ch  RSLT
 A           B
*ALL
```

⇩
(omitted)
⇩

```
    RF ADJUST MODE
A17:A11-A16 ALL ADJUST

 Auto Adjust Complete
```

```
A17-ALL OK
```

(6) ⇩ Confirm
(7) ⇩ [SET]
(8) ⇩ Data save

```
*A1F:NV-RAM CONTROL
```

For Condition NG/Automatic Adjustment Failure

Confirm in the procedure below when message “Condition NG” or “Auto Adjust Failure” is displayed during execution of adjustment menus A11 to A17.

(1) Confirm whether the specified alignment tape is used.
If the specified alignment tape is not used, execute the automatic adjustment by the specified one.
SR5-1 for 525/60 system, SR5-1P for 625/50 system
(2) Clean the drum (video heads) referring to the “For Condition NG” in “3-2-3. RF CHECK Mode (C1)”.
This operation is not required when the drum has been already cleaned.
(3) Perform the automatic adjustment menu A17 when message “Condition NG” or “Auto Adjust Failure” is displayed during execution of menus other than menu A17 or A13.
If no abnormality is found, the adjustment is completed.

If the message “Condition NG” is displayed, the possible cause below are considered.

- Servo system adjustment defect or circuit defect
  ⇨ Readjust the servo system. (A00-01 : SERVO ADJUST)
  ⇨ Check the servo system. (C03 : REEL/CAPSTAN MOTOR & FG CHECK)
- RF system adjustment defect
  ⇨ Readjust the RF system. (A1 : RF ADJUST)
- Worn PB head in the drum assembly
  ⇨ After confirming the hours meter (H02 : DRUM RUNNING HOURS), replace the upper drum assembly as required.
  (Refer to Section 5-2 or 5-3.)
- Adjustment defect in tape transport system or component part installation defect.
  ⇨ Readjust the tape transport system or reinstall the parts.
  (Refer to Sections 5 and 6.)
- EQ-75 board defect
- Drum assembly defect

Or if the message “Auto Adjust Failure” is displayed, the possible above and following cause are considered.

- Brush/slip ring assembly defect or its part installation/ connection defect
  ⇨ Replace or reinstall the brush/slip ring assembly.
  (Refer to Section 5-4.)
- Harness (between EQ-75 board and drum assembly) connection defect

A1F : NV-RAM CONTROL

The A1F : NV-RAM CONTROL menu is used to save the RF adjustment data adjusted in the RF ADJUST mode in NV-RAM.
The current adjustment data can return to the former state when “ALL DATA PREVIOUS” is selected before the adjustment data is saved in NV-RAM.

Notes

- Do not save the adjustment data in NV-RAM when abnormality is found during automatic adjustment (when message “Auto Adjust Failure” or “Condition NG” is displayed).
- When the adjustment data was not stored in this menu, it returns to the state before adjustment if the power is turned off.

To execute the menu

(1) Turn the search dial and move the ∗ mark on the superimpose picture as described below.
To save the adjustment data after adjustment:
⇨ “SAVE ALL ADJUST DATA”
To return to the adjustment data before adjustment
⇨ “ALL DATA PREVIOUS”
  - In a time data display area, “SAVE ALL ADJUST DATA” and “ALL DATA PREVIOUS” are displayed as messages “SAVE ALL ADJUST” and “ALL DATA PREVIOUS”, respectively.

(2) Press the SET button.
  - The data transmission is initiated when the SET button is pressed.
  - Message “Saving ...” or “Loading ...” is displayed on the superimpose picture, and message “SAVING” or “LOADING” is displayed in the time data display area.

(3) Confirm that the data transmission is completed.
  - After data transmission is completed, message “Save Complete” or “Load Complete” is displayed on the superimpose picture, and message “SAVE COMPLETE” or “LOAD COMPLETE” is displayed in the time data display area.

(4) Press the MENU button to terminate the menu.

Example of display and operation

(In data save)

Superimpose picture

```
    RF ADJUST MODE
 A1F:NV-RAM CONTROL

*NO OPERATION
 SAVE ALL ADJUST DATA
 ALL DATA PREVIOUS
```

Time data display area

```
NO OPERATION
```

(1) ⇩ DIAL (∩)

```
    RF ADJUST MODE
 A1F:NV-RAM CONTROL

 NO OPERATION
*SAVE ALL ADJUST DATA
 ALL DATA PREVIOU
```

```
SAVE ALL ADJUST
```

(2) ⇩ SET

```
    RF ADJUST MODE
 A1F:NV-RAM CONTROL

 Saving . .
```

```
SAVING
```

⇩

```
    RF ADJUST MODE
 A1F:NV-RAM CONTROL

 Save Complete
```

```
SAVE COMPLETE
```

(3) ⇩ Confirm
(4) ⇩ MENU

3-2-7. AUDIO/VIDEO ADJUST Mode (A2)

The A2 : AUDIO/VIDEO ADJUST mode is used to adjust the audio and video systems.
This unit has eight menus.
In an A23 : SDI VR menu, five submenus (including the submenu displayed when the options are installed) are available.

- A2 : AUDIO/VIDEO ADJUST
  - A20 : VPR VR
  - A21 : AD VR
  - A22 : AD VR (LOOP)
  - A23 : SDI VR
    - A231 : SDI ENC1 VCO
    - A232 : SDI ENC2 VCO
    - A233 : SDI DEC VCO
    - A234 : SDTI ENC VCO -- For BKNW-118
    - A235 : SDTI DEC VCO -- For BKNW-117
  - A24 : INPUT CF DETECT
  - A25 : DEC VR
  - A26 : DEC VR (LOOP)
  - A2F : NV-RAM CONTROL

Menu Tree of Audio/Video Systems Adjustment Mode

CAUTION

Do not change the adjustment data carelessly. This may cause a trouble. For the actual adjustment, refer to the adjustment method described in Section 4.
If you have changed the adjustment data carelessly, execute ALL DATA PREVIOUS in an A2F : NV-RAM CONTROL menu or turn off the power of this unit without selecting an A2F : NV-RAM CONTROL menu.
Never execute SAVE ALL ADJUST DATA.

The adjustment menus other than submenus of A23 and menu A24 are used for manual adjustment.
In the submenus of A23 and menu A24, automatic adjustment (AUTO) or manual adjustment (MANUAL) can be selected.
For the automatic adjustment, refer to the operation example described in each menu.

To change the adjustment data manually

(1) Turn the search dial on the superimpose picture and move the ∗ mark to the item to be adjusted.
Turn the search dial in the time data display area and display the item to be adjusted.
(2) Turn the search dial while pressing the JOG button.
The adjustment data then increases or decreases.

To execute the automatic adjustment

(1) Turn the search dial on the superimpose picture and move the ∗ mark to “MANUAL”.
Turn the search dial in the time data display area and display “MANUAL”.
(2) Turn the search dial in FORWARD (↻) direction while pressing the JOG button. Message “Auto (Push SET Button)” is then displayed on the superimpose picture, and message “PUSH SET” is displayed in the time data display area.
(3) The automatic adjustment is executed when the SET button is pressed.
- Only the display on the superimpose picture changes as described below. The displayed data value also changes.

  Auto adjusting .. : Automatic adjustment is in progress.
  Auto Adjust Complete : Automatic adjustment is completed.
  Auto Adjust Failure : Automatic adjustment fails.

To return the adjustment data to the former state

Execute ALL DATA PREVIOUS in an A2F : NV-RAM CONTROL menu.

Note

The current adjustment data can not return to the former state after executing SAVE ALL DATA ADJUST DATA.

To save the adjustment data

Execute SAVE ALL ADJUST DATA in an A2F : NV-RAM CONTROL menu.

A20 : VPR VR

```
AUDIO/VIDEO ADJUST MODE
A20:VPR VR

*REF 1ST FLD DET      80
 VIDEO 1/2 LEVEL      80
 VIDEO 3 LEVEL        80
 Y OUTPUT LEVEL       80
 R-Y OUTPUT LEVEL     80
 B-Y OUTPUT LEVEL     80
 B-CAM R-Y OUT LEVEL  80
 B-CAM B-Y OUT LEVEL  80
 INT 4FSC FREQ        80
```

525/60 System

```
AUDIO/VIDEO ADJUST MODE
A20:VPR VR

*REF 1ST FLD DET      80
 VIDEO 1/2 LEVEL      80
 VIDEO 3 LEVEL        80
 Y OUTPUT LEVEL       80
 R-Y OUTPUT LEVEL     80
 B-Y OUTPUT LEVEL     80
 INT 4FSC FREQ        80
```

625/50 System

This menu is used to adjust the reference signal and analog video output systems on the VPR-47 board. In 525/60 and 625/50 systems, the displayed adjustment items differ.

The adjustment item below must be adjusted in both 525/60 and 625/50 systems.

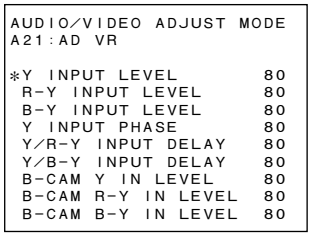
Adjustment item	Description
REF 1ST FLD DET	First-field detection timing of reference signal
VIDEO 1/2 LEVEL	Composite video output (1/2) level
VIDEO 3 LEVEL	Composite video output (3) level
Y OUTPUT LEVEL	Component video Y output level
R-Y OUTPUT LEVEL	Component video R-Y output level
B-Y OUTPUT LEVEL	Component video B-Y output level
INT 4FSC FREQ	Free-running frequency of internal reference signal 4fsc

The adjustment item below is used exclusively for a 525/60 system.

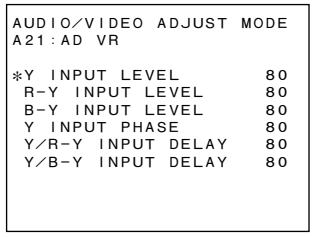
Adjustment item	Description
B-CAM R-Y OUT LEVEL	R-Y output (Betacam) level
B-CAM B-Y OUT LEVEL	B-Y output (Betacam) level

http://getMANUAL.com

A21 : AD VR


AUDIO/VIDEO ADJUST MODE
A21:AD VR
*Y INPUT LEVEL 80
R-Y INPUT LEVEL 80
B-Y INPUT LEVEL 80
Y INPUT PHASE 80
Y/R-Y INPUT DELAY 80
Y/B-Y INPUT DELAY 80
B-CAM Y IN LEVEL 80
B-CAM R-Y IN LEVEL 80
B-CAM B-Y IN LEVEL 80

In 525/60 system



In 625/50 system

The adjustment item below is adjusted in either of a 525/60 or 625/50 system.

Adjustment item	Description
Y INPUT LEVEL	Y input level
R-Y INPUT LEVEL	R-Y input level
B-Y INPUT LEVEL	B-Y input level
Y INPUT PHASE	Y input phase
Y/R-Y INPUT DELAY	R-Y input delay compensation
Y/B-Y INPUT DELAY	B-Y input delay compensation

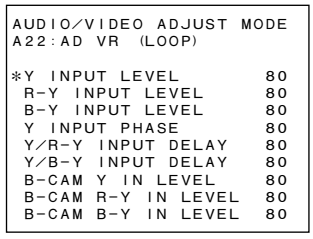
The adjustment item below is used exclusively for a 525/60 system.

Adjustment item	Description
B-CAM Y IN LEVEL	Y input (Betacam) level
B-CAM R-Y IN LEVEL	R-Y input (Betacam) level
B-CAM B-Y IN LEVEL	B-Y input (Betacam) level

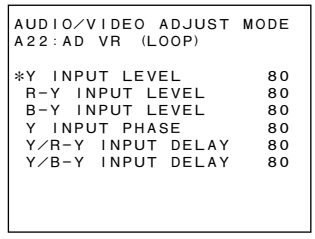
Note

The adjustment data in an A21 : AD VR menu is used in common with an A22 : AD VR (LOOP) menu.

A22 : AD VR(LOOP)


AUDIO/VIDEO ADJUST MODE
A22:AD VR (LOOP)
*Y INPUT LEVEL 80
R-Y INPUT LEVEL 80
B-Y INPUT LEVEL 80
Y INPUT PHASE 80
Y/R-Y INPUT DELAY 80
Y/B-Y INPUT DELAY 80
B-CAM Y IN LEVEL 80
B-CAM R-Y IN LEVEL 80
B-CAM B-Y IN LEVEL 80

In 525/60 system



In 625/50 system

In this menu, the most suitable signal for adjustment is output from an internal video test signal generator (refer to the table below), and the component video input system can be adjusted with the multi-loop function activated. The adjustment item is the same as for A21: AD VR.

Note

The adjustment data in an A22 : AD VR (LOOP) menu is used in common with an A21 : AD VR menu.

Adjustment item	Test signal
Y INPUT LEVEL R-Y INPUT LEVEL B-Y INPUT LEVEL	100% Color Bars
Y INPUT PHASE	NTC7 (NTSC): 525/60 system Line330 (625): 625/50 system
Y/R-Y INPUT DELAY Y/B-Y INPUT DELAY	Bowtie
B-CAM Y IN LEVEL B-CAM R-Y IN LEVEL B-CAM B-Y IN LEVEL	75% Color Bars

A23 : SDI VR

```
AUDIO/VIDEO ADJUST MODE
A23:SDI VR

*A231:SDI ENC1 VCO
 A232:SDI ENC2 VCO
 A233:SDI DEC VCO
 A234:SDTI ENC VCO
 A235:SDTI DEC VCO
```

This menu is used to adjust the VCO free-running frequency of SDI and SDTI input/output interfaces.
Five submenus (including for option) are available.
Automatic or manual adjustment can be selected.

A231 : SDI ENC1 VCO

This submenu is used for an SDI output interface (SDI encoder).

A232 : SDI ENC2 VCO

This submenu is used for an SDI output interface (SDI encoder) with superimpose function.

A233 : SDI DEC VCO

This submenu is used for an SDI input interface (SDI decoder).

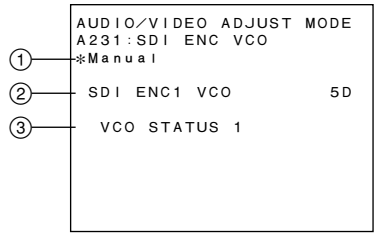
A234 : SDTI ENC VCO

This submenu is used for an SDTI output interface (SDTI encoder). This submenu is displayed when the BKNW-118 option is installed.

A235 : SDTI DEC VCO

This submenu is used for an SDTI input interface (SDTI decoder). This submenu is displayed when the BKNW-117 option is installed.

Description of superimpose picture



Ex. A231 : SDI ENC1 VCO

① The adjustment mode (manual and automatic) or the messages during automatic adjustment are displayed in this line.

Manual :	Adjustment mode is set to the manual adjustment.
Auto (Push SET Button) :	Press the SET button to initiate the automatic adjustment.
Auto Adjusting ... :	Automatic adjustment is in progress.
Auto adjust Complete :	Automatic adjustment is completed.
Auto Adjust Failure :	Automatic adjustment fails.

Note

The adjustment data can be manually changed even if message “Auto (Push SET Button)” is displayed.

② The adjustment item and adjustment data value are displayed in this line.

③ The VCO status is displayed as “0” or “1”.

Change of adjustment mode

The relation between the adjustment mode and display is shown in the table below.

Adj. mode	Superimpose picture	Time data display area
Manual adjustment	Manual	MANUAL
Automatically adjustable	Auto (Push SET Button)	PUSH SET

(i) Turn the search dial in REVERSE (↺) direction and move the * mark to line ① on the superimpose picture. (In a time data display area, “MANUAL” or “PUSH SET” is displayed.)
(ii) Turn the search dial while pressing the JOG button.
Manual ⇨ Automatic: JOG + DIAL (↻)
Manual ⇦ Automatic: JOG + DIAL (↺)

To execute the automatic adjustment

(1) Display “Auto (Push SET Button)” on the superimpose picture and “PUSH SET” in the time data display area referring to the “Change of adjustment mode” described above.

(2) The automatic adjustment is executed when the SET button is pressed.
- The display on the superimpose picture changes to “Auto Adjusting...”. The displayed data value also changes.
  The display in the time data display area does not change.

(3) Confirm the automatic adjustment completion on the superimpose picture.
- Message “Auto Adjust Complete” is displayed when the automatic adjustment is completed.

Note

Refer to the “For automatic adjustment failure” below when message “Auto Adjust Failure” is displayed.

(4) To terminate the menu, press the MENU button.
To execute the automatic adjustment again in this menu, return to step (2).

(5) To save the adjustment data in NV-RAM, execute SAVE ALL ADJUST DATA in an A2F : NV-RAM CONTROL menu.
To return the adjustment data to the state before adjustment, execute ALL DATA PREVIOUS in an A2F : NV-RAM CONTROL menu.

For automatic adjustment failure

Confirm that no abnormality exists in the cable connecting the SDI-41 board and the rear panel. If no abnormality is found in the connection, the SDI-41 board is considered to be defective.

Caution during manual adjustment

Measuring equipment is required when performing the manual adjustment. For the actual manual adjustment, refe to the adjustment method described in Section 4-9.

Note

For the data changing, refer to the “To change the adjustment data manually” on page 3-56.

Example of display and operation

Example of A231 : SDI ENC1 VCO

Superimpose picture / Time data display area

```
AUDIO/VIDEO ADJUST MODE
A231:SDI ENC1 VCO
*Manual

 SDI ENC1 VCO          74

  VCO STATUS 0
```

MANUAL

(1) ⇩ JOG + DIAL (↻)

```
AUDIO/VIDEO ADJUST MODE
A231:SDI ENC1 VCO
*Auto (Push SET button)

 SDI ENC1 VCO          74

  VCO STATUS 0
```

PUSH SET

(2) ⇩ SET

```
AUDIO/VIDEO ADJUST MODE
A231:SDI ENC1 VCO
*Auto Adjusting ...

 SDI ENC1 VCO          00

  VCO STATUS 0
```

PUSH SET

⇩

(omitted)

⇩

```
AUDIO/VIDEO ADJUST MODE
A231:SDI ENC1 VCO
*Auto Adjust Complete

 SDI ENC1 VCO          5C

  VCO STATUS 1
```

PUSH SET

(3) ⇩ Confirm

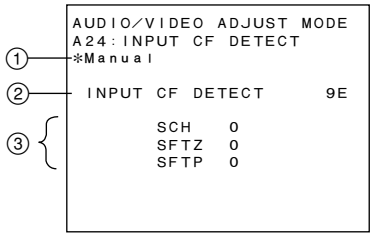
(4) ⇩ MENU

(5) ⇩ MENU

⇩ Data save

```
*A2F:NV-RAM CONTROL
```

A24 : INPUT CF DETECT



This menu is used to adjust the color frame detection timing of a composite video input signal.
Preparation (refer to Section 4-9) is required for the adjustment.

Description of superimpose picture

① The adjustment mode (manual and automatic adjustments) or the messages during automatic adjustment are displayed in this line.

Manual :	Adjustment mode is set to the manual adjustment.
Auto (Push SET Button):	Press the SET button to initiate the automatic adjustment.
Auto Adjusting ... :	Automatic adjustment is in progress.
Auto adjust Complete :	Automatic adjustment is completed.
Auto Adjust Failure :	Automatic adjustment fails.

Note

The adjustment data can be manually changed even if message “Auto (Push SET Button)” is displayed.

② The adjustment item and adjustment data value are displayed in this line.

③ Each status is displayed as “0” or “1”.
0: When the specification is not satisfied
1: When the specification is satisfied
(For SFTP, the status is displayed in alternate “0” and “1” when the specification is satisfied.)

Change of adjustment mode

The relation between the adjustment mode and display is shown in the table below.

Adj. mode	Superimpose picture	Time data display area
Manual adjustment	Manual	MANUAL
Automatically adjustable	Auto (Push SET Button)	PUSH SET

(i) Turn the search dial in REVERSE (↺) direction and move the ∗ mark to line ① on the superimpose picture. (In a time data display area, “MANUAL” or “PUSH SET” is displayed.)
(ii) Turn the search dial while pressing the JOG button.
Manual ⇨ Automatic: JOG + DIAL (↺)
Manual ⇦ Automatic: JOG + DIAL (↻)

To execute the automatic adjustment

(1) Display “Auto (Push SET Button)” on the superimpose picture and “PUSH SET” in the time data display area referring to the “Change of adjustment mode” described above.
(2) The automatic adjustment is executed when the SET button is pressed.
- The display on the superimpose picture changes to “Auto Adjusting...”. The displayed data value also changes.
  The display in the time data display area does not change.

(3) Confirm the automatic adjustment completion and each status on the superimpose picture.
- Message “Auto Adjust Complete” is displayed when the automatic adjustment is completed.
  Status for SCH and SFTZ are displayed as “1”.
  For SFTP is displayed in alternate “0” and “1”.

Note

If the preparation for adjustment is not proper, message “Auto Adjust Failure” is displayed.

(4) To terminate the menu, press the MENU button.
To execute the automatic adjustment again in this menu, return to step (2).
(5) To save the adjustment data in NV-RAM, execute SAVE ALL ADJUST DATA in an A2F : NV-RAM CONTROL menu.
To return the adjustment data to the state before adjustment, execute ALL DATA PREVIOUS in an A2F : NV-RAM CONTROL menu.

Example of display and operation

Superimpose picture

```
AUDIO/VIDEO ADJUST MODE
A24:INPUT CF DETECT
*Manual

 INPUT CF DETECT      9E

        SCH    0
        SFTZ   0
        SFTP   0
```

Time data display area: MANUAL

(1) ⇩ JOG + DIAL(↻)

```
AUDIO/VIDEO ADJUST MODE
A24:INPUT CF DETECT
*Auto (Push SET button)

 INPUT CF DETECT      9E

        SCH    0
        SFTZ   0
        SFTP   0
```

Time data display area: PUSH SET

(2) ⇩ SET

```
AUDIO/VIDEO ADJUST MODE
A24:INPUT CF DETECT
*Auto Adjusting ...

 INPUT CF DETECT      00

        SCH    0
        SFTZ   0
        SFTP   0
```

Time data display area: PUSH SET

⇩

(omitted)

⇩

```
AUDIO/VIDEO ADJUST MODE
A24:INPUT CF DETECT
*Auto Adjust Complete

 INPUT CF DETECT      85

        SCH    1
        SFTZ   1
        SFTP   0
```

Time data display area: PUSH SET

(3) ⇩ Confirm
(4) ⇩ MENU
(5) ⇩ MENU
⇩ Data save

```
*A2F:NV-RAM CONTROL
```

Caution during manual adjustment

Confirm the adjustment data range in which the SCH status is set to “1” and set the adjustment data to the intermediate value when performing the manual adjustment.

Note

For the manual adjustment, refer to the “To change the adjustment data manually” on page 3-57.

A25 : DEC VR

```
AUDIO/VIDEO ADJUST MODE
A25:DEC VR

*VIDEO GAIN          80
 AGC VIDEO GAIN      80
 VIDEO PEDESTAL      80
```

This menu is used to adjust the composite video input system.

Adjustment item	Description
VIDEO GAIN	Composite video input level (During AGC OFF setting)
AGC VIDEO GAIN	Composite video input level (During AGC ON setting)
VIDEO PEDESTAL	Composite video input level pedestal

Note

The adjustment data in an A25 : DEC VR menu is used in common with the same adjustment item in an A26 : DEC VR (LOOP) menu.

A26 : DEC VR (LOOP)

```
AUDIO/VIDEO ADJUST MODE
A25:DEC VR (LOOP)

*VIDEO GAIN          80
```

This menu is used to adjust the composite video input system.
The most suitable signal (refer to the table below) for adjustment is output from an internal video test signal generator, and the composite video input system can be adjusted with the multi-loop function activated.

Adjustment item	Test signal
VIDEO GAIN	100% Color Bars

Note

The adjustment data in an A26 : DEC VR (LOOP) menu is used in common with the same adjustment item in an A25 : DEC VR menu.

A2F : NV-RAM CONTROL

The A2F : NV-RAM CONTROL menu is used to save the audio/video adjustment data adjusted in the AUDIO/ VIDEO ADJUST mode in NV-RAM.
The current adjustment data can return to the state before adjustment when “ALL DATA PREVIOUS” is selected before the adjustment data is saved in the NV-RAM.

Note

When the adjustment data was not stored in this menu, it returns to the state before adjustment if the power is turned off.

To execute the menu

(1) Turn the search dial and move the ∗ mark on the superimpose picture as described below.
To save the adjustment data after adjustment
⇨ “SAVE ALL ADJUST DATA”
To return to the adjustment data before adjustment
⇨ “ALL DATA PREVIOUS”
- In a time data display area, “SAVE ALL ADJUST DATA” and “ALL DATA PREVIOUS” are displayed as messages “SAVE ALL ADJUST” and “ALL DATA PREVIOUS”, respectively.

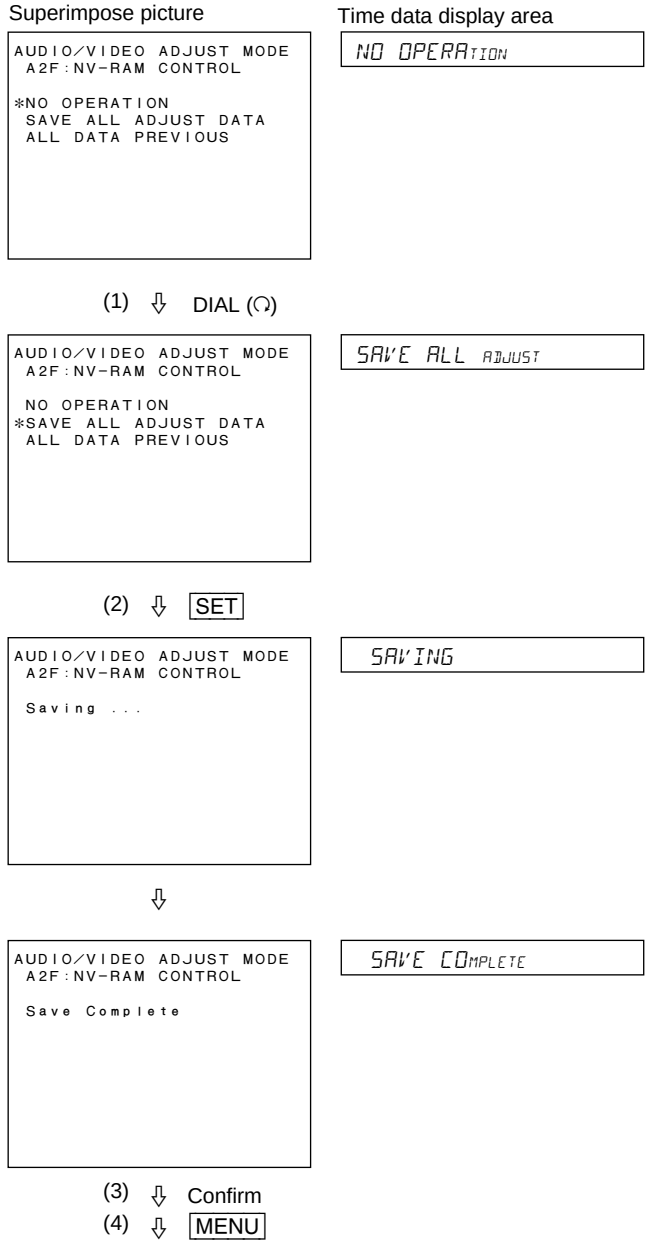
(2) Press the SET button.
- The data transmission is initiated when the SET button is pressed.
- Message “Saving...” or “Loading...” is displayed on the superimpose picture, and message “SAVING” or “LOADING” is displayed in the time data display area.

(3) Confirm that the data transmission is completed.
- After data transmission is completed, message “Save Complete” or “Load Complete” is displayed on the superimpose picture, and message “SAVE COMPLETE” or “LOAD COMPLETE” is displayed in the time data display area.

(4) Press the MENU button to terminate the menu.

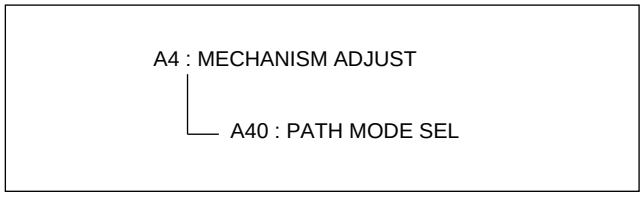
Example of display and operation

(In data save)



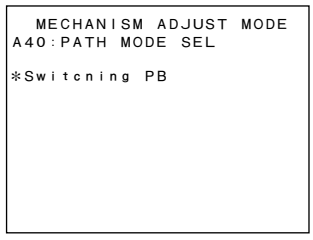
3-2-8. MECHANISM ADJUST Mode (A4)

The A4 : MECHANISM ADJUST mode is used to adjust the mechanism. This mode contains the one menu below.



Menu Tree of MECHANISM Adjustment Mode

A40 : PATH MODE SEL



This menu sets the PB mode for confirming and adjusting video tracking. Switching PB and full PB modes are available for setting.
A PB signal is output to the test point (TP106) on the SS-83 board by the REC head when the tape is played back with this menu opened. (The signal output from this test point becomes an envelope waveform.)
In the switching PB mode, only the data area (helical track) based on an SX format is played back.
In the full PB mode, the overlap portion before and behind the data area based on an SX format is played back.
The switching PB mode is always set when the menu is opened.

PB mode setting

To set the PB mode, turn the search dial while pressing the JOG button and display the desired setting.

Menu operation

A white square is displayed in the upper-right position of the superimpose picture when the SET button is pressed after the switching PB and full PB modes are set. The unit then enters the ordinary operation state (in which the ordinary operation of this unit except a menu system can be performed.)
In this state, play back the specified alignment tape, and confirm and adjust the video tracking.
However, character information (time code or operation status) superimposed during ordinary operation is not displayed.
To return to the former state, press the MENU button.

Note

For the video tracking confirmation and adjustment, refer to “6-1-3. Video Tracking Confirmation and Adjustment”.

3-3. Error Logger Display Mode (M2)

3-3-1. Outline

This unit has an error log function that records the error generated or detected in this unit.
The error logger display mode is used to superimpose the contents (data) of the error log on the video monitor. The ordinary display mode (refer to Section 3-3-2) and the setting mode (refer to Section 3-3-3) that displays the menu to limit the error log display are available in this unit.
The calendar/clock date incorporated into this unit can be set in the setting mode.

Activation and Termination

The two methods below are used to activate the error logger display mode. To terminate the error logger display mode, press the MENU button in the display mode. It returns to the operation state before activation when the error logger display mode is terminated.

A. Select an M2 : ERROR LOGGER menu in the maintenance mode.
B. Press the MENU button while pressing the ENTRY button on the lower control panel during ordinary operation.

Error Log

The recorded error log is classified into three categories: TAPE ERROR, WARNING, and CONDITION. (The error log belongs to the three types.)
Each log is constituted by a message, error generation date, and time code.
The message varies depending on the type of a log.
The error generation date is the date based on the calendar and clock of this unit. (The year is omitted.)
The time code records the time code (LTC) data of the VTR side which is stored in this unit at the error occurs.

The maximum number of stored log is 300. If the number of log exceeds 300, the contents of oldest error log is erased sequentially.

TAPE ERROR

An error code and error message are recorded as a message when the error (error codes 01 to 99) related to a VTR and system occurs.
When multiple sub-error messages are displayed, the three sub-error messages from the top are recorded.
For the error message, refer to Section 1-26.

WARNING

The warning log below is recorded in an error log.

- REFERENCE MISSING
  This message is recorded when no signal is input to the REF VIDEO (reference video signal) connector after the power is turned on.

CONDITION

The condition logs below are recorded in an error log.

- VIDEO PB CONDITION RED
  This message is recorded when the channel condition becomes red during video PB operation.
- AUDIO PB CONDITION RED
  This message is recorded when the channel condition becomes red during audio PB operation.

3-3-2. Display Mode

The operation in the ordinary display mode is described based on a display example on the superimpose picture.
The log number/total log count is displayed in the second line. “(001/000)” is displayed when no log exists.
The third to tenth lines (eight lines) are the area where logs are displayed. The three-digit number on the left indicates the log number. The contents of a log are displayed on its right.
A calendar/clock is displayed on the lowest line.

Notes

- The top screen on the right is the example displayed when the error logger mode is first activated after the power is turned on. The second-time or later screen is displayed with the preceding display completed.
- In a time data display area, only the log number/total log count (e.g., “ERR LOG 001/003”) is displayed.

Search dial (JOG mode)

To display the log number not displayed on the screen, turn the search dial and move the ∗ mark.

CTL/TC/UB button

On this screen, the whole message is displayed partially. To display other information (date and time code), press the CTL/TC/UB button.

F FWD button

The whole contents of a log to which the ∗ mark was set are displayed while the F FWD button is pressed.
The category (error code for TAPE ERROR) of an error log is displayed in the third line. Messages are displayed in the fourth and fifth line
s, and sub-error messages in the sixth to eighth lines. The date (not including the year) is displayed in the ninth line, and time code in the tenth line.
Other logs can be displayed in this display state when the search dial is turned with the F FWD button pressed.

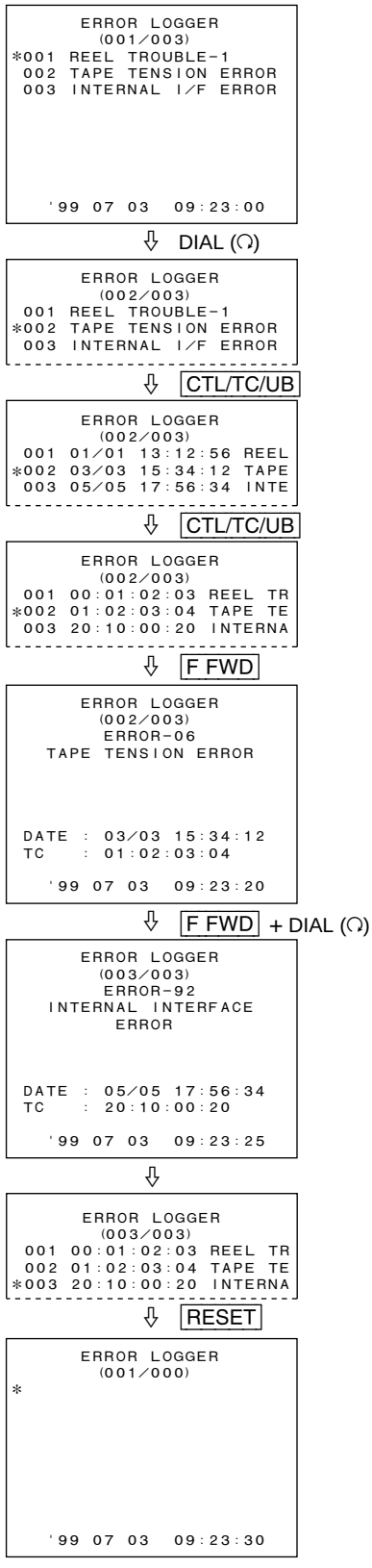
RESET button

The recorded all logs are erased when the RESET button is pressed.

Note

Usually, do not erase any log.
There may be some error logs that are useful for confirmation of the progress when a trouble occurs or that are important in preventing a trouble from occurrence.

Example of display and operation



http://getMANUAL.com

SET button

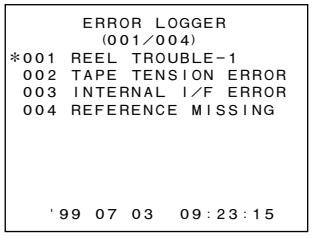
A white square mark is displayed in the upper-right position of the superimpose picture when the SET button is pressed. The unit then enters the normal operation state (in which the normal operation of this unit except a menu system can be performed).
However, the character information (time code or operation status) superimposed during normal operation is not displayed in this case.
To return to the former state, press the MENU button.

MENU button

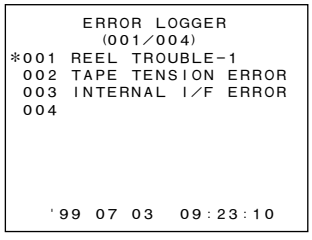
The display returns to the error logger display mode when the MENU button is pressed with the white square displayed in the upper-right position of the superimpose picture.
Pressing the MENU button in the error logger display mode terminates the error logger display mode.

Limited-display screen

For the error log of a category that is set to OFF in the menu of setting mode (refer to Section 3-3-3), information items other than a log number are not displayed. However, the whole display using the F FWD button is not influenced by the setting.

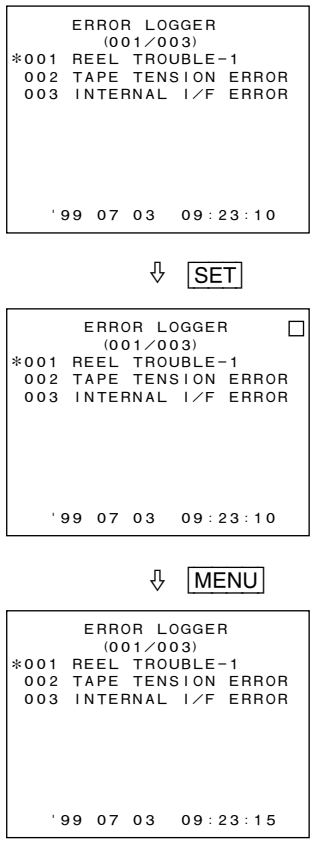


Ordinary Screen (No limited-display)



Only Warning Turned Off

Example of display and operation



3-3-3. Setting Mode

The setting mode is used to display a menu that limits the display of an error log. In this menu, the display can be turned on and off for each error log category. A calendar/clock can also be set in this menu.

Notes

- The top and second screens on the right are the examples displayed when the error logger mode and setting mode are first activated after the power is turned on. The second-time or later screen is displayed with the preceding display completed.
- A white square mark is displayed in the upper-right position of the superimpose picture as in the display mode when the SET button is pressed in the setting mode (except when "Push SET Button" is displayed during calendar/clock setting). The unit then enters the normal operation state (in which the normal operation of this unit except a menu system can be performed). The former state is returned when the MENU button is pressed.

Entering the setting mode

Press the SET button while pressing the STOP button in the display mode.

Returning to the display mode

Press the SET button again while pressing the STOP button or press the MENU button.

Setting menu

The seventh to tenth lines on the superimpose picture are a setting menu. The display in the display mode is left in the first to fifth lines.
Each setting when the power is turned on is all ON.
The error log belonging to a category is limited in display when each item is set to OFF. (Refer to the "Limited-display screen" on the previous page.)
The changed setting is valid until the power is turned off.
How to change the setting is described below.

(1) Turn the search dial and move the ∗ mark to the category to be changed in setting.

Notes

- In a time data display area, the contents of the ∗-marked line are displayed on the superimpose picture.
- Turn the search dial continuously in FORWARD (↻) direction for the calendar/clock setting. (Refer to the next page.)

(2) To change the setting from ON to OFF, turn the search dial in REVERSE (↺) direction while pressing the JOG button.
To change it from OFF to ON, turn the search dial in FORWARD (↻) direction while pressing the JOG button.

(3) To change the setting of other categories, repeat steps (1) and (2).

(4) Press the MENU button to terminate the setting mode.

Example of display and operation

Display mode

```
      ERROR LOGGER
        (001/003)
*001 REEL TROUBLE-1
 002 TAPE TENSION ERROR
 003 INTERNAL I/F ERROR




   '99 07 03  09:23:15
```

⇩ STOP + SET

Setting mode

```
      ERROR LOGGER
        (001/003)
 001 REEL TROUBLE-1
 002 TAPE TENSION ERROR
 003 INTERNAL I/F ERROR
------------------------
*TAPE ERROR          ON
 WARNING             ON
 CONDITION           ON


   '99 07 03  09:23:17
```

⇩ DIAL(↻)

```
      ERROR LOGGER
        (001/003)
 001 REEL TROUBLE-1
 002 TAPE TENSION ERROR
 003 INTERNAL I/F ERROR
------------------------
 TAPE ERROR          ON
*WARNING             ON
 CONDITION           ON


   '99 07 03  09:23:20
```

⇩ JOG + DIAL(↻)

```
      ERROR LOGGER
        (001/003)
 001 REEL TROUBLE-1
 002 TAPE TENSION ERROR
 003 INTERNAL I/F ERROR
------------------------
 TAPE ERROR          ON
*WARNING            OFF
 CONDITION           ON


   '99 07 03  09:23:22
```

⇩ JOG + DIAL(↻)

```
      ERROR LOGGER
        (001/003)
 001 REEL TROUBLE-1
 002 TAPE TENSION ERROR
 003 INTERNAL I/F ERROR
------------------------
 TAPE ERROR          ON
*WARNING             ON
 CONDITION           ON


   '99 07 03  09:23:24
```

Calendar/clock setting

The calendar/clock's date and time of this unit can be adjusted in the setting mode as described below.
In a display/operation example on the right, 9:23 of July 3rd in 1999 is set to 15:00 of August 1st in 1999.

(1) Turn the search dial slowly and turn on and off the numerical value (year, month, day, hour, minute, or second) of the calendar/clock item to be changed.

Notes

- When an ∗ mark is displayed in the setting menu, turn the search dial continuously in FORWARD (↻) direction until the numerical value blinks. For the calendar/clock setting, an ∗ mark is not displayed on the superimpose picture.
- Do not turn the search dial excessively in REVERSE (↺) direction during setting. An ∗ mark is displayed in the setting menu and the calendar/clock setting is stopped.

(2) Turn the search dial while pressing the JOG button and change the numerical value to the desired one.

Notes

- The count display of seconds stops when the numerical value is changed. The internal data is updated.
- On the superimpose picture, message "Push SET Button" is displayed in the upper line.

(3) Repeat steps (1) and (2) until the numerical values in other items are changed completely.

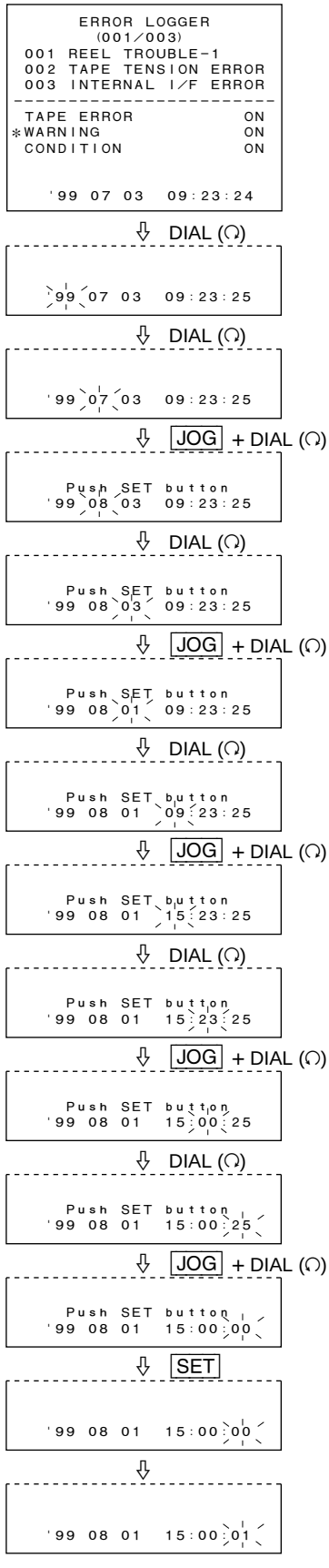
(4) Press the SET button to save the setting values.

Notes

- To change only the date, the time must also be set again.
- To cancel the calendar/clock setting, terminate the setting mode or turn the search dial in REVERSE (↺) direction until an ∗ mark is displayed in the setting menu (the setting menu item is displayed for a time data display area).
- The unit enters the normal operation state when the SET button is pushed with message "Push SET Button" not displayed on the superimpose picture. Press the MENU button to return to the former state.
- To set the time accurately, press the SET button immediately the display and current time coincided.

(5) Press the MENU button to terminate the setting mode.

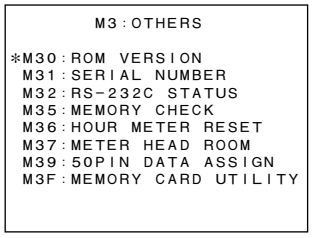
Example of display and operation



3-4. OTHERS CHECK Mode (M3)

3-4-1. Outline

The OTHERS check mode is used for other checks. This unit has the six menus and two submodes (M39 and M3F) below.

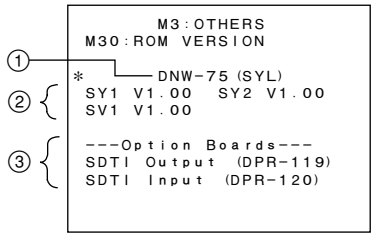


OTHERS CHECK mode

Title	Page	Description
M30 : ROM VERSION	3-71	Displays the unit's model name, ROM version, and optionally mounted board.
M31 : SERIAL NUMBER	3-71	Displays and corrects the serial number of this unit.
M32 : RS-232C STATUS	3-72	Displays the interface communication state of an RS-232C connector.
M35 : MEMORY CHECK	3-73	Displays the data in ROM. (Used for check at the factory.)
M36 : HOUR METER RESET	3-73	Displays and resets the resettable hours meter and thread counter.
M37 : METER HEAD ROOM	3-74	Sets the head room of an audio level meter.
M39 : 50PIN DATA ASSIGN	3-75	Sets the 50-pin parallel remote.
M3F : MEMORY CARD UTILITY	3-78	Uploads and downloads the software using the memory card box.

3-4-2. ROM VERSION Display Menu (M30)

This menu displays the model name of this unit, the destination, the ROM version, and the information of the installed option.



Description of superimpose picture

① The model name of this unit and the destination in parentheses are displayed on the superimpose picture. The model name and destination are detected from the setting condition of the DIP switch (S1102) on the SS-83 board.

② Each version number of system control ROMs (SY1 and SY2) and a servo ROM (SV1) is displayed on the superimpose picture.

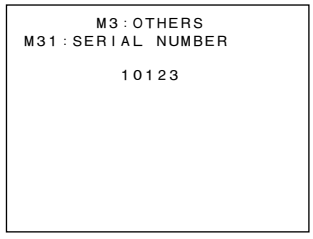
③ The installed options are displayed as described below when the option is installed.
BKDW-118 ⇨ SDTI Output (DPR-119)
BKNW-117 ⇨ SDTI Input (DPR-120)

Menu operation

Turn the search dial to move the ∗ mark.
The contents of an ∗-marked item on the superimpose picture are displayed in a time data display area.
The installed option is displayed on only the superimpose picture.

3-4-3. SERIAL NUMBER Display Menu (M31)

This menu displays the serial number of this unit. When each serial number does not coincide because of repair, it can be set again in this menu.



Notes

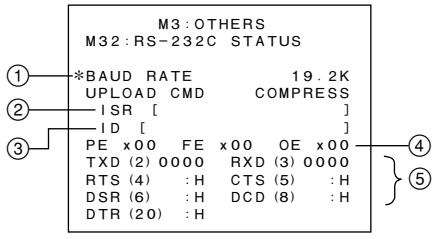
- Set the serial number again after the MS-58 board or the NV-RAM (IC9 on the MS-58 board) is replaced.
- "−−−−−" is displayed in the state where no serial number is set.

Serial number setting

(1) Turn the search dial to turn on and off the digit you wish to set.
(2) Turn the search dial while pressing the JOG button and change the digit number.
  - Message "Push SET Button" is displayed on only the superimpose picture when the serial number is changed.
  - To cancel the setting, press the MENU button to terminate this menu.
(3) Repeat steps (1) and (2) for each digit.
(4) Press the SET button to save the set serial number.
  - Message "Saving..." is displayed on only the superimpose picture. If no abnormality is found, the display changes to "Save Complete" after a few seconds.

3-4-4. RS-232C STATUS Display Menu (M32)

(This menu fail to function at present.)
This menu displays the communication state of an RS-232C interface. The communication baud rate can also be changed in this menu.



Note

Only the information of the communication baud rate is displayed in a time data display area.

Description of superimpose picture

① The communication baud rate is displayed on the superimpose picture. The baud rate can be selected from among the followings. (The factory setting is 19.2 K.)
1200, 2400, 4800, 9600, 19.2K (bps)

Note

In a time data display area, 19.2K is displayed as "19 2K".

② The status of an ISR protocol is displayed on the superimpose picture.

ISR x [yyyy . . . . .]
ⓐ ⓑ

ⓐ Displays the protocol status of this unit.
A: ACK send
N: NAK send
T: ATN (OPC or QRESP) send
W: ACK wait
X: XOFF receive, XON wait

ⓑ Displays the last ISR command that was received properly. (The preceding command is displayed until ACK transmission is completed.)

If no object for communication is connected to the RS-232C connector, items ⓐ and ⓑ become blank.

③ The device ID is displayed on the superimpose picture. The device ID is set using the DEVICE command of an ISR protocol. This setting is maintained (even if the power is turned off) until it is changed by the DEVICE command. The device ID becomes blank when it is not set.

④ The number of errors below that occur during reception is displayed on the superimpose picture.
PE: Parity error
FE: Framing error
OE: Overrun error
If no object for communication is connected to the RS-232C connector, each error is not displayed as a time count, but as "x00".

⑤ The TXD/RXD signal displays the number of data items (number of bytes) properly sent and received in this unit in four digits (hexadecimal).
Other signals display the connection state of an RS-232C connector in a high level (+3 V or more, or non-connection) and low level (−3 V or less).
If no object for communication is connected to the RS-232C connector, TXD and RXD are displayed as "0000".

Setting of communication baud rate

(1) Turn the search dial while pressing the JOG button and display the desired baud rate.
- Message "Push SET Button" is displayed on only the superimpose picture when the setting is changed.
- To cancel the setting, press the MENU button to terminate this menu.

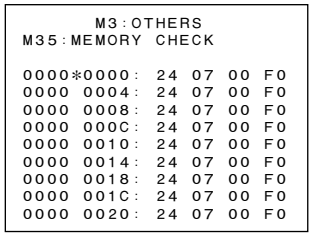
(2) Press the SET button to save the setting.
- Message "Saving ..." is displayed on only the superimpose picture. If no abnormality is found, the display changes to "Save Complete" after a few seconds.
  To turn off "Save Complete", turn the search dial.

Note

A white square is displayed in the upper-right position of the superimpose picture when the SET button is pressed except during communication baud rate setting. This unit then enters the ordinary operation state (in which the ordinary operation of this unit except a menu system can be performed).
However, the character information (time code or operation status) superimposed during ordinary operation is not displayed.
To return to the former state, press the MENU button.

3-4-5. MEMORY CHECK Display Menu (M35)

This menu displays the ROM data installed in this unit in hexadecimal.



Note

This menu is used for inspection at the factory.

Menu operation

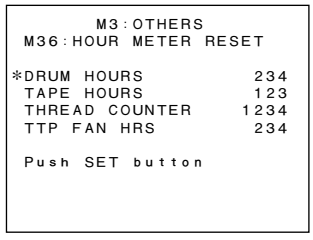
Turn the search dial to move the ∗ mark upward or downward. The address and data display portions are then scrolled.
Turn the search dial while pressing the JOG button: The address then changes 100H at a time.
Turn the search dial while pressing the VAR button: The address then changes 10000H at a time.
Turn the search dial while pressing the JOG and VAR buttons: The address then changes 1000000H at a time.
The contents of the ∗-marked line on the superimpose picture are displayed in a time data display area.

Note

A white square is displayed in the upper-right position of the superimpose picture when the SET button is pressed. This unit then enters the ordinary operation state (in which the ordinary operation of this unit except a menu system can be performed).
However, the character information (time code or operation status) superimposed during ordinary operation is not displayed.
To return to the former state, press the MENU button.

3-4-6. HOUR METER RESET Menu (M36)

This menu can display and reset the values of the resettable hours meter and thread counter.



Description of superimpose picture

DRUM HOURS: Indicates the total of drum rotation time. Same as in setup menu ITEM-H12.
TAPE HOURS: Indicates the total of tape transport time. Same as in setup menu ITEM-H13.
THREAD COUNTERS: Indicates the total of threading count. Same as in setup menu ITEM-H14.
TTP FAN HRS: Indicates the total of fan (MD) time used. Same as in setup menu ITEM-H15.

Menu operation

Turn the search dial to move the ∗ mark.
The contents of the ∗-marked line on the superimpose picture are displayed in a time data display area.

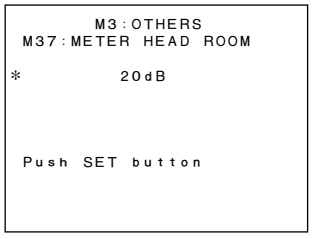
To reset

The former state cannot be returned when the SET button is pressed for reset operation.

(1) Turn the search dial and move the ∗ mark to the item to be reset.
(2) Turn the search dial in REVERSE (↺) direction while pressing the JOG button. = The display value then becomes zero (“0”).
  - Message “Push SET Button” is displayed on only the superimpose picture when the display value is set to “0”.
  - To return to the former state, turn the search dial in FORWARD (↻) direction.
(3) If there are other items to be reset, repeat steps (1) and (2).
(4) Press the SET button to save the reset data.
  - Message “Saving ...” is displayed on only the superimpose picture. If no abnormality is found, the display changes to “Save Complete” after a few seconds.
    To turn off “Save Complete”, turn the search dial.

3-4-7. METER HEAD ROOM Setup Menu (M37)

This menu can change the head room setting of an audio level meter.
The head room can be selected from among the followings.
(The factory setting is 20 dB.)
20 dB, 18 dB, 16 dB, 15 dB, 14 dB, 12 dB, 9 dB



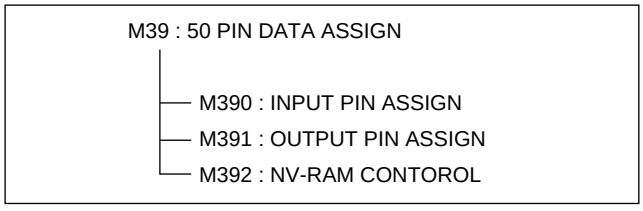
Head room setting

(1) Turn the search dial while pressing the JOG button, and the desired setting is then displayed.
- Message “Push SET Button” is displayed on only the superimpose picture when the setting is changed.
- To cancel the setting, press the MENU button to terminate this menu.

(2) Press the SET button to save the changed setting.
- Message “Saving...” is displayed on only the superimpose picture. If no abnormality is found, the display changes to “Save Complete” after a few seconds.
  To turn off “Save Complete”, turn the search dial.

3-4-8. 50PIN DATA ASSIGN Mode (M39)

M39 : 50PIN DATA ASSIGN changes and resets the pin setup data of 50-pin parallel remote which are settable. Also displays the logic level of the input pin.
Three menus are available.



Menu Tree of 50PIN DATA ASSIGN

CAUTION

Do not change the setting data carelessly. This may cause a trouble. For the actual setting, refer to the optional parallel remote (50-pin) connector interface manual.
If you have changed the setting data carelessly, execute ALL DATA PREVIOUS in an M392: NV-RAM CONTROL menu or turn off the power of this unit without selecting an M392: NV-RAM CONTROL. Never execute SAVE ALL DATA.

M390 : INPUT PIN ASSIGN

This menu changes and resets the input pin setup data. Also displays the logic level of the input pin.

Description of display

The pin numbers are displayed at the line of "No.". Also the right at the pin number is displayed the logic level state (H;high, L;low).

To change the setup data

(1) Turn the search dial (JOG mode) and move the ∗ mark to the left side of the data to be changed.

(2) Turn the search dial while pressing the JOG button to change the data.
FORWARD direction (↻): Data value increase
REVERSE direction (↺): Data value decrease

Note

At the first bite, the data change only area of which from 00 to 73. If it is required to extend the area of which from 00 to FF, turn the search dial while pressing the EJECT and PLAY buttons simultaneously.

(3) Repeat steps (1) and (2) for any other data.
(4) Press the MENU button to terminate the menu.
(5) To save the setup data in the NV-RAM, execute the SAVE ALL DATA in an M392: NV-RAM CONTROL menu.

Example of display and operation

```
   50PIN DATA ASSIGN
M390:INPUT PIN ASSIGN

 No.        Command
---+--------------------
 01:H∗20 10 00 00 00 00
 18:H 20 30 00 00 00 00
 19:H 20 05 00 00 00 00
 20:H 20 20 00 00 00 00
 21:H 40 10 00 00 00 00
 22:H 20 04 00 00 00 00
 23:H 20 0F 00 00 00 00
```

(1) ⇩ DIAL

```
   50PIN DATA ASSIGN
M390:INPUT PIN ASSIGN

 No.        Command
---+--------------------
 01:H 20 10 00 00 00 00
 18:H 20∗30 00 00 00 00
 19:H 20 05 00 00 00 00
 20:H 20 20 00 00 00 00
 21:H 40 10 00 00 00 00
 22:H 20 04 00 00 00 00
 23:H 20 0F 00 00 00 00
```

(2) ⇩ JOG +DIAL

```
   50PIN DATA ASSIGN
M390:INPUT PIN ASSIGN

 No.        Command
---+--------------------
 01:H 20 10 00 00 00 00
 18:H 20∗50 00 00 00 00
 19:H 20 05 00 00 00 00
 20:H 20 20 00 00 00 00
 21:H 40 10 00 00 00 00
 22:H 20 04 00 00 00 00
 23:H 20 0F 00 00 00 00
```

(4) ⇩ MENU
(5) ⇩ Data save

```
∗M392:NV-RAM CONTROL
```

M391 : OUTPUT PIN ASSIGN

This menu changes and resets the output pin setup data. Also displays the logic level of the input pin.

Description of display

The pin numbers are displayed at the line of “No.”. Also the right at the pin number is displayed the logic level state (H;high, L;low).

To change the setup data

(1) Turn the search dial (JOG mode) and move the ∗ mark to the left side of the data to be changed.
(2) Turn the search dial while pressing the JOG button to change the data.
FORWARD direction (↻): Data value increase
REVERSE direction (↺): Data value decrease

Note

At the first bite, the data change only area of which from 00 to 73. If it is required to extend the area of which from 00 to FF, turn the search dial while pressing the EJECT and PLAY buttons simultaneously.

(3) Repeat steps (1) and (2) for any other data.
(4) Press the MENU button to terminate the menu.
(5) To save the setup data in the NV-RAM, execute the SAVE ALL DATA in an M392: NV-RAM CONTROL menu.

Example of display and operation

```
   50PIN DATA ASSIGN
M391:OUTPUT PIN ASSIGN

 No.       Command
---+--------------------
 10:H*02 02 72 20 00 00
 11:H 02 02 72 10 00 00
 12:H 01 02 00 20 00 00
 13:H 02 02 2B 08 00 00
 26:H 02 02 72 08 00 00
 27:H 02 02 04 10 00 00
 28:H 02 02 01 10 00 00
```

(1) ⇩ DIAL

```
   50PIN DATA ASSIGN
M391:OUTPUT PIN ASSIGN

 No.       Command
---+--------------------
 10:H 02 02 72 20 00 00
 11:H 02*02 72 10 00 00
 12:H 01 02 00 20 00 00
 13:H 02 02 2B 08 00 00
 26:H 02 02 72 08 00 00
 27:H 02 02 04 10 00 00
 28:H 02 02 01 10 00 00
```

(2) ⇩ [JOG]+DIAL (↻)

```
   50PIN DATA ASSIGN
M391:OUTPUT PIN ASSIGN

 No.       Command
---+--------------------
 10:H 02 02 72 20 00 00
 11:H 02*01 72 10 00 00
 12:H 01 02 00 20 00 00
 13:H 02 02 2B 08 00 00
 26:H 02 02 72 08 00 00
 27:H 02 02 04 10 00 00
 28:H 02 02 01 10 00 00
```

(4) ⇩ [MENU]
(5) ⇩ Data save

```
*M392:NV-RAM CONTROL
```

http://getMANUAL.com

M392 : NV-RAM CONTROL

The M392: NV-RAM CONTROL menu is used to save the input/output data set in the 50 PIN DATA ASSIGN mode. The current setup data can return to the former state when “ALL DATA PREVIOUS” is selected before the setup data is saved in NV-RAM.

Note

When the setup data was not stored in this menu, it returns to the state before changing by turning the power off.

To execute the menu

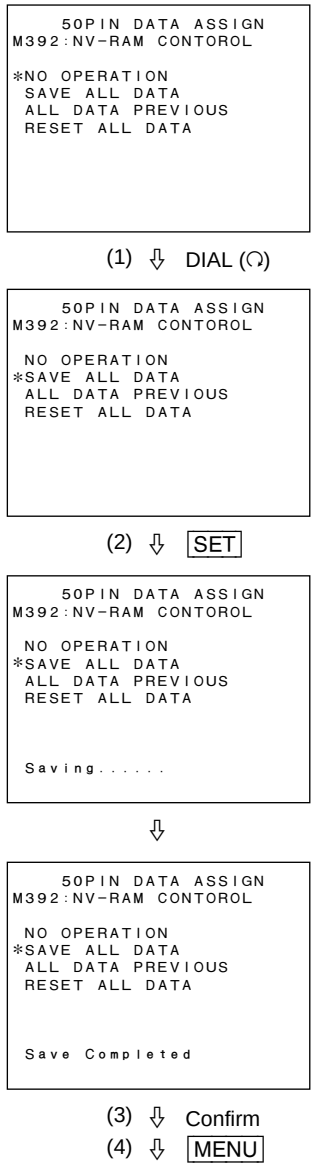
(1) Turn the search dial and move the ∗ mark on the superimpose picture as described below.
To save the setup data after changing:
⇨ “SAVE ALL DATA”
To return the setup data before changing:
⇨ “ALL DATA PREVIOUS”
To return the setup data to factory setting, and save that data:
⇨ “RESET ALL DATA”

(2) Press the SET button.
- The data transmission is initiated when the SET button is pressed.
- Message “Saving...” or “Loading...” is displayed on the superimpose picture.

(3) Confirm that the data transmission is completed.
- After data transmission is completed, message “Save Complete” or “Load Complete” is displayed on the superimpose picture.

(4) Press the MENU button to terminate the menu.

Example of display and operation



3-4-9. MEMORY CARD UTILITY Mode (M3F)

M3F : MEMORY CARD UTILITY uploads/downloads the firmware of the unit.
(This mode fail to function at present.)

Section 4
Electrical Alignment

4-1. Electrical Alignment Overview

4-1-1. Notes on Electrical Alignment

- Be sure to adjust each block in order unless any instructions are provided.
- Never touch (or turn) the adjustment part carelessly.
- Do not execute automatic adjustment carelessly, and do not change adjustment data carelessly.
  If executed or changed carelessly, turn off the power of the VTR or execute “ALL DATA PREVIOUS” in each NV-RAM control menu so as not to save the data.
  Note
  NV-RAM control menu for the servo and DT systems have no function “ALL DATA PREVIOUS”.
  If executed carelessly the automatic adjustment, turn off the power of the VTR.
- For details on the maintenance mode, refer to Section 3.
- Before beginning adjustment, it is recommended to make a copy of check sheets given in the installation manual “Appendix A” and write down setup conditions such as switches’ setting in the check sheets.
  If setup conditions are noted, the settings can be returned easily to its original condition after finishing adjustment.

4-1-2. Outline of Electrical Alignment

In Section 4 explains the all electrical adjustment to each block (include the optional boards).

Block	Reference	Contents	Object of adjustment
Power supply unit	Section 4-2	Output voltage check/adjustment of power supply unit	———
Search dial	Section 4-3	Search dial pulse duty adjustment	PTC-69
Servo	Section 4-4	Servo system alignment	MS-58, SS-83
RF	Section 4-5	RF system alignment	EQ-75
Audio	Section 4-6	Adjustments of Analog audio input/output line	APR-40
Video	Section 4-7	Adjustments of Video reference signal, Video process, and Analog video output	VPR-47
Video input	Section 4-8	Adjustments of Analog composite input line and Analog DEC-110 component input line	DEC-110
SDI/SDTI	Section 4-9	Free-running VCO adjustment of Encoder/Decoder for SDI and SDTI interface	SDI-41, DPR-119, DPR-120
Video remote control	Section 4-10	TBC remote control offset adjustment	FP-117
Full erase, Time code	Section 4-11	LTC system adjustment/check and Full erasure current check	TC-102

4-2. Power Supply Line Alignment

4-2-1. Output Voltage Check

When the power supply unit in the VTR was replaced, perform the output voltage check.

Note

Be sure to perform the check before reattaching the bottom plate.

Tool

- Digital voltmeter: ADVANTEST TR6845 or equivalent

Preparation

1. Turn off the power.
2. Disconnect the power cord and all cables on connector panel.
3. Place the VTR on its right side panel down.
4. When the bottom plate was reattached, remove it. (Refer to Section 1-3-1.)
5. Connect the power cord.
6. Wait for 10 minutes after turning on the power.

Voltage Check

Check each output voltage of power supply lines at the following points.

Note

Measure at the terminal contact of the connected harness wire.

Line	Measurement point	Specification	Remarks
+3.4 V	CN254-1A/MAIN2(orange)	+3.4 ±0.3 V	⊘
+5.1 V	CN254-3A/MAIN2(brown)	+5.2 ±0.3 V	⊘
+8 V	CN254-5A/MAIN2(red)	+7.7 ±0.7 V	⊘
−8 V	CN252-4/MAIN2(glay)	−7.7 ±0.7 V	
+15 V	CN254-9B/MAIN2(blue)	+15.0 ±1.0 V	
−15 V	CN254-9A/MAIN2(glay)	−15.0 ±1.0 V	
+12 V	CN252-6/MAIN2(glay)	+12.0 ±1.0 V	
+2.5 V	CN254-5B/MAIN2(yellow)	+2.5 ±0.2 V	⊘
+18 V	CN253-1/MAIN2(brown)	+18.0 ±2.0 V	

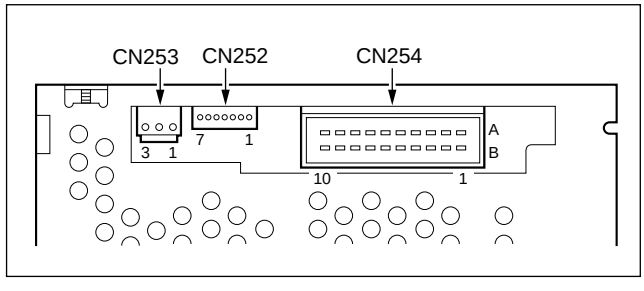
If the specification is not satisfy

- For the power lines with a ⊘-mark in remarks column of the above table: Can be adjusted the output voltage. Be sure to adjust with the power supply unit settled in adjustable condition referring to Section 4-2-2.
- For without a ⊘-mark in remarks column of the above table: Can not be adjusted the output voltage. Replace the power supply unit, or make sure that repair of this unit had been completed.

Note

Pin assignments of the connectors (CN252, CN253, and CN254) in the power supply unit are as follows:

Ref. No.	Pin No.	Output voltage (Signal name)	Wire color
CN252	1	GND	White
	2	GND	Gray
	3, 4	−8 V	Gray
	5	(FAN MOTOR CHECK)	Gray
	6	+12 V	Gray
	7	GND	Gray
CN253	1	18 V (UNREG +18 V)	Brown
	2, 3	GND (UNREG GND)	Black
CN254	1A, 2A	+3.4 V	Orange
	3A, 4A	+5.1 V	Brown
	5A, 6A	+8 V	Red
	7A, 8A	GND	Black
	9A	−15 V	White
	10A	GND	Black
	1B, 2B	+3.4 V	Orange
	3B, 4B	+5.1 V	Brown
	5B	+2.5 V	Blue
	6B	+8 V	Red
	7B, 8B	GND	Black
	9B	+15 V	White
	10B	GND	Black



Power Supply Unit (MAIN2 Board)

4-2-2. Output Voltage Adjustment

When the power supply unit was repaired, perform the adjustment (check) under disclosing the power supply unit.

CAUTION

Since the primary circuit is exposed, be extremely careful with not to get an electric shock.
When completing the adjustments and checks, turn off the POWER switch without delay.

Tools List

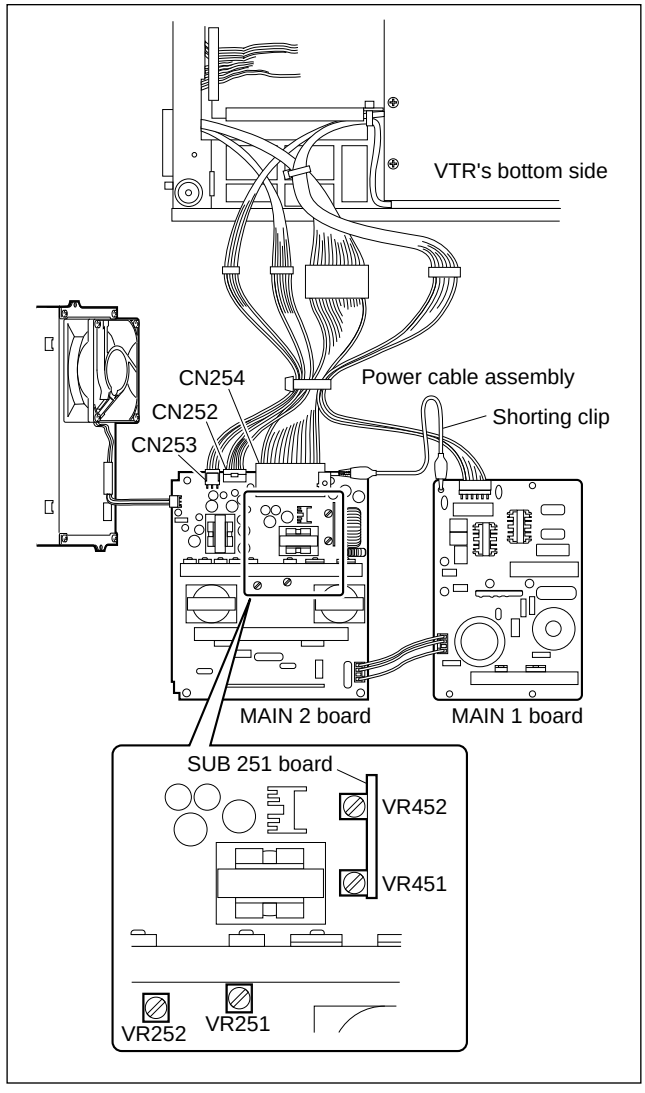
- Digital voltmeter: ADVANTEST TR6845 or equivalent
- Power cable assembly (Part No. A-8321-333-A)
- Shorting clip

Preparation

1. Turn off the power.
2. Disconnect the power cord and all cables on connector panel.
3. Remove the power supply unit.
   (Refer to Section 5-29.)
4. Reattach a power supply panel assembly under staying on the VTR's right side panel down.
   (Do not reattach the bottom plate.)
5. Connect the four connectors of the power cable assembly to each connector of the VTR's harnesses that were connected to the power supply unit before.
6. Take a power supply unit to pieces as figure of right.
   (Refer to the exploded views in Section 2 of the maintenance manual volume-2.)
7. Reconnect the MAIN1 board and MAIN2 board with a harness of the power supply unit.
8. Connect the four connectors of the power cable assembly to the MAIN1 board and MAIN2 board.

   Note

   Be sure to confirm that nothing is the cause of the short circuit under the MAIN1 and MAIN2 boards.
9. Connect both GND of the MAIN1 board and MAIN2 board with a shorting clip.
10. Connect the power cord.
11. Wait for 10 minutes after turning on the power.



Voltage Adjustment (Check)

Adjust and check each output voltage of power supply lines at the following points.

Line	Measurement point	Specification	Adjust. point
+3.4 V	CN254-1A/MAIN2(orange)	+3.4 ±0.3 V	⊘VR451/SUB251
+5.1 V	CN254-3A/MAIN2(brown)	+5.2 ±0.3 V	⊘VR251/MAIN2
+8 V	CN254-5A/MAIN2(red)	+7.7 ±0.7 V	⊘VR252/MAIN2
−8 V	CN252-4/MAIN2(glay)	−7.7 ±0.7 V	Check only
+15 V	CN254-9B/MAIN2(blue)	+15.0 ±1.0 V	Check only
−15 V	CN254-9A/MAIN2(glay)	−15.0 ±1.0 V	Check only
+12 V	CN252-6/MAIN2(glay)	+12.0 ±1.0 V	Check only
+2.5 V	CN254-5B/MAIN2(yellow)	+2.5 ±0.2 V	⊘VR452/SUB251
+18 V	CN253-1/MAIN2(brown)	+18.0 ±2.0 V	Check only

4-3. Dial Pulse Adjustment (PTC-69 Board)

When the PTC-69 board was replaced or the dial pulse generating circuit on the PTC-69 board was repaired, perform the dial pulse adjustment.

Note

Be sure to perform the adjustments with the search dial assembly separated from the lower control panel assembly. When uniting both assemblies, remove the search dial assembly from the lower control panel assembly as follows:

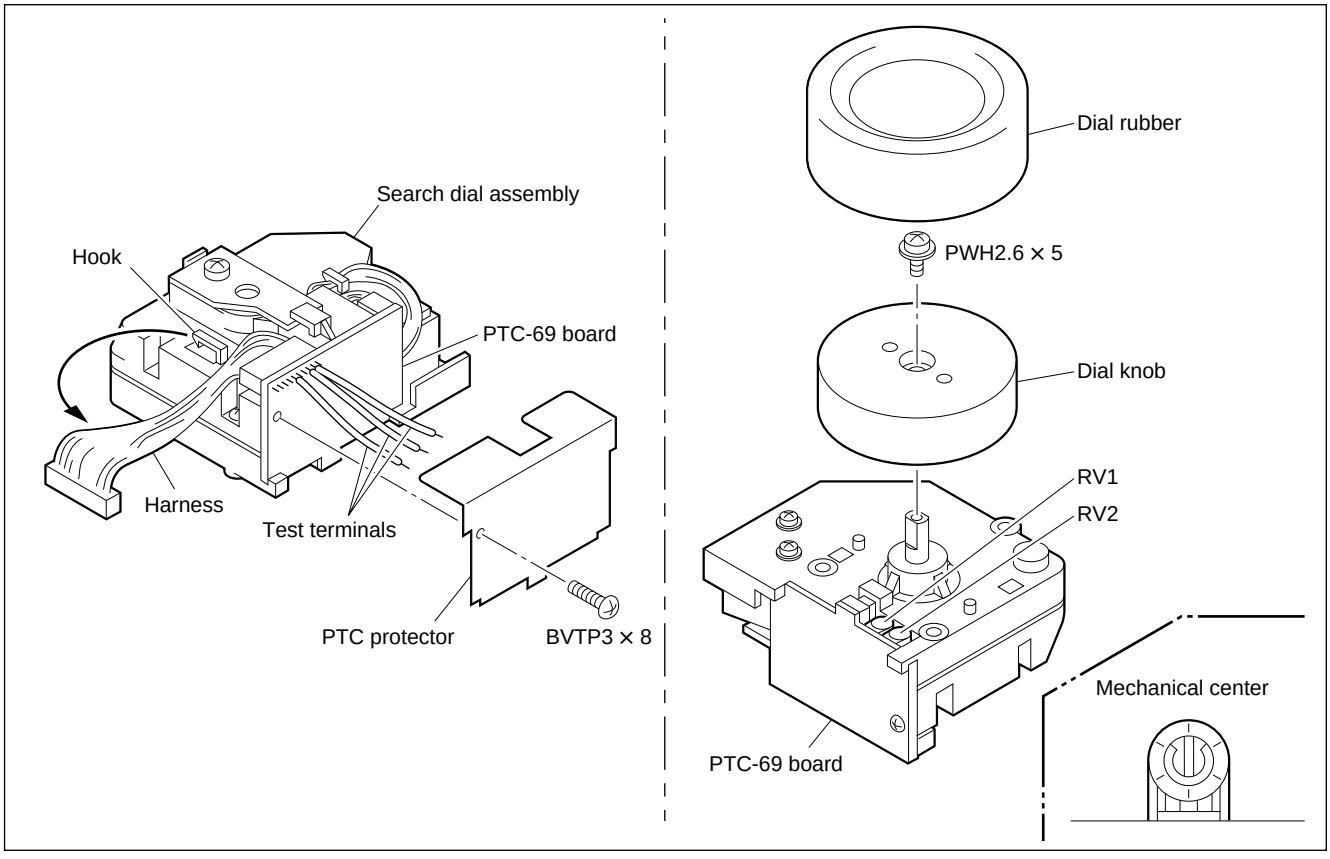
1. Remove a panel from the lower control panel assembly. (Refer to Section 1-3-2.)
2. Remove the dial rubber, dial knob, and search dial assembly from the lower control panel assembly. (Refer to the exploded views in Section 2 of the maintenance manual volume-2.)
3. Disconnect the harness from CN69 on the KY-438 board in the lower control panel assembly.

Tools List

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Solder iron
- Test terminals, such as covered wire (3 pieces)

Preparation

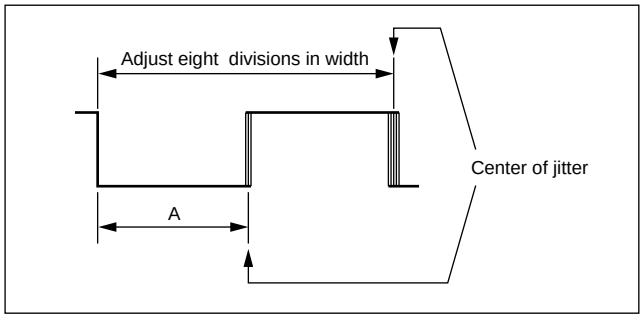
1. Remove the PTC protector after removing a screw.
2. Solder the three test terminals to the connector CN2's pins 2, 3 and 6 on side B of the PTC-69 board.
3. Fix the PTC-69 board with the screw that is removed at step 1 (without the PTC protector).
4. Attach the dial knob and dial rubber to the search dial assembly.
5. When the PTC-69 board is replaced, set RV1 and RV2 to the mechanical center.
   When the potentiometer RV1 or RV2 is replaced, set it (RV1 or RV2) to the mechanical center.
6. Connect the harness to CN69 on the KY-438 board with this harness unhooked.
7. Turn on the POWER switch after connecting the power cord.
8. To turn the search dial to JOG mode, press the JOG button.



Preparation

Adjustment (Check)

1. Connect the oscilloscope's CH-1 input as follows:
   X: Pin 2 of CN2 (soldered test terminal)
   G: Pin 6 of CN2 (soldered test terminal)
2. During turn the search dial at uniform speed and reverse direction (↺), adjust the sweep time on the oscilloscope to align the 1 cycle waveform to 8 divisions width.
3. During turn the search dial at the same as step 2, check that the duty ratio on waveform satisfies the specification. If the specification is not satisfied, perform the adjustment.
   Adj. point: ⊘RV1/PTC-69 (inside RV)
   Specification: Duty ratio 0.50 ±0.04
   (A = 4.0 ±0.3 divisions width)
4. Connect the oscilloscope's CH-1 input as follows:
   X: Pin 3 of CN2 (soldered test terminal)
   G: Pin 6 of CN2 (soldered test terminal)
5. During turn the search dial at uniform speed and forward direction (↻), adjust the sweep time on the oscilloscope to align the 1 cycle waveform to 8 divisions width.
6. During turn the search dial at the same as step 5, check that the duty ratio on waveform satisfies the specification. If the specification is not satisfied, perform the adjustment.
   Adj. point: ⊘RV2/PTC-69 (outside RV)
   Specification: Duty ratio 0.50 ±0.04
   (A = 4.0 ±0.3 divisions width)



Waveform on Oscilloscope

Perfection

1. Turn off the POWER switch.
2. Unsolder and remove the three test terminals from CN2 on the PTC-69 board.
3. Remove the screw fixing the PTC-69 board, then fix the PTC-69 board and PTC protector with removed screw.
4. Hook the harness that connected to the lower control panel assembly.
5. Remove the dial rubber and dial knob from the search dial assembly.
6. Reinstall the search dial assembly to the lower control panel assembly.
7. Reattach the panel on the lower control panel assembly.
8. Reattach the dial knob and dial rubber.

4-4. Servo System Alignment

4-4-1. Adjustment Overview

All the adjustments of the servo and DT systems are adjusted using the menus in the maintenance mode. When the MS-58 board or NV-RAM (IC9/MS-58 board) was replaced, be sure to initialize the NV-RAM referring to Section 4-4-2 before starting the adjustments of the servo system alignment.

Note

For detail of each menu in the maintenance mode, refer to Section 3.
The countermeasures against the malfunction of an automatic adjustment (an error message "ADJUST INCOMPLETE" will be displayed on the video monitor) had been described there.

Tools List

To perform the servo system alignment for the VTR, prepare the following equipment and fixtures.

- Alignment tapes: SR2-1 (Part No. 8-960-075-11) and
  SR2-1P (Part No. 8-960-075-61)
- Analog composite video monitor
  (NTSC/PAL switchable type)

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Adjustment Items

Section	Item (Section title)		Adjustment point	Remarks
4-4-2	Servo adjustment data initialization		S100/SS-83	Perform Section 4-4-2 only when replacing the MS-58 board or NV-RAM (IC9/MS-58).
4-4-3	Servo continuity automatic adjustment		A000 : A001-A008 ADJ.	S reel FG duty adjustment (A001) T reel FG duty adjustment (A002) Capstan FG duty adjustment (A003) S reel offset/friction adjustment (A004) T reel offset/friction adjustment (A005) S reel torque adjustment (A006) T reel torque adjustment (A007) S/T reel tension offset adjustment (A008)
		Data save	A012 : NV-RAM CONTROL	
4-4-4	Capstan free speed adjustment		A010 : CAPSTAN SPEED	Perform the adjustment and data saving in both
	(Standard video system)	Data save	A012 : NV-RAM CONTROL	525/60 and 625/50 systems.
4-4-5	RF switching position adjustment		A011 : RE SWITCHING POS.	Perform the adjustment and data saving in either
		Data save	A012 : NV-RAM CONTROL	525/60 or 625/50 system.
4-4-7	Capstan free speed adjustment		A010 : CAPSTAN SPEED	
	(Another video system)	Data save	A012 : NV-RAM CONTROL	

4-4-2. Servo Adjustment Data Initialization

After replacing the MS-58 board or NV-RAM (IC9/MS-58 board) on, have to initialize the servo adjustment data stored the NV-RAM on MS-58 board.
Can to initialize in the following procedure.

Note

After the initialization, be sure to perform Section 4-4-3 through 4-4-8.

How to initialize

With S100/SS-83(D-1) pressing, turn on the power.
Before releasing S100, wait three seconds after the power-on.

Note

If the system error (ERROR-97) occurs at this time, turn off the power and retry.

4-4-3. Servo Continuity Automatic Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A000 : A001-A008 ADJ.
3. To execute this adjustment, press the SET button once on the lower control panel.
   - The execution time is about 150 seconds.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
4. To exit the this menu, press the MENU button once on the lower control panel.

Data save (Store the adjusted data)

Note

Do not save the adjustment data if the automatic adjustment was not completed normally.

5. Enter A012 : NV-RAM CONTROL, then execute “SAVE SERVO ADJUST DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.

6. To exit the maintenance mode, press the MENU button five times.

4-4-4. Capstan Free Speed Adjustment (Standard Video System)

Prepare the following alignment tape to perform this adjustment.
DNW-75 (at 525/60 system): SR2-1
DNW-75P (at 625/50 system): SR2-1P

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A010 : CAPSTAN FREE SPEED.
3. Insert the alignment tape SR2-1 (or SR2-1P), then the adjustment is executed automatically.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
   - The alignment tape is ejected.
4. To exit this menu, press the MENU button once.

Data save (store the adjusted data)

5. Enter A012 : NV-RAM CONTROL, then execute “SAVE SERVO ADJUST DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
6. To exit the maintenance mode, press the MENU button five times.
7. Eject the alignment tape.

4-4-5. RF Switching Position Adjustment

Prepare the following alignment tape to perform this adjustment.

- SR2-1 (at 525/60 system)
- SR2-1P (at 625/50 system)

Note

Be sure to adjust in either 525/60 or 625/50 system. When the adjustment is performed in one system, it is not required in the other system.

1. Insert the alignment tape SR2-1/SR2-1P, then advances it to the time code 00:25:00:00.
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A011 : RF SWITCHING POS.
   - The alignment tape is ejected on the way to menu A011.
4. Select “AUTO”.
5. Insert this alignment tape again, then the adjustment is executed automatically.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
6. To exit this menu, press the MENU button once.

Data save (Store the adjusted data)

7. Enter A012 : NV-RAM CONTROL, then execute “SAVE SERVO ADJUST DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.

8. To exit the maintenance mode, press the MENU button five times.
9. Eject the alignment tape.

4-4-6. Preparation in Another Video System

Note

Be sure to perform the adjustments in the another video system after completing the adjustments in the standard video system.

Switch the video system to the another video system of this unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 of the operation manual.) And switch the video system of the video monitor.
DNW-75: 625/50 system (PAL)
DNW-75P: 525/60 system (NTSC)

4-4-7. Capstan Free Speed Adjustment (Another Video System)

Prepare the following alignment tape to perform this adjustment.
DNW-75 (at 625/50 system): SR2-1P
DNW-75P (at 525/60 system): SR2-1

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A010 : CAPSTAN FREE SPEED.
3. Insert the alignment tape SR2-1P (or SR2-1), then the adjustment is executed automatically.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
   - The alignment tape is ejected.
4. To exit this menu, press the MENU button once.

Data save (store the adjusted data)

5. Enter A012 : NV-RAM CONTROL, then execute “SAVE SERVO ADJUST DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
6. To exit the maintenance mode, press the MENU button five times.

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4-4-8. Perfection

Return the video system to standard video system of this unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 of the operation manual.)
And return the video system of the video monitor.
DNW-75: 525/60 system (NTSC)
DNW-75P: 625/50 system (PAL)

4-5. RF System Alignment (EQ-75 Board)

4-5-1. Adjustment Overview

For the RF adjustment, perform the automatic adjustments in the menu of the maintenance mode.

Note

For detail of each menu in the maintenance mode, refer to Section 3.
The countermeasures against the malfunction of an automatic adjustment (an error message “Auto Adjust Failure” or “Condition NG” will be displayed on the video monitor) had been described there.

Tools List

To perform the RF system alignment for the VTR, prepare the following equipment and fixtures.

- Analog composite video monitor
  Note
  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Cleaning tape: BCT-5CLN (Sony’s standard products)
- Alignment tape
  For DNW-75: SR5-1 (Part No. 8-960-075-01)
  For DNW-75P: SR5-1P (Part No. 8-960-075-51)
- Recording tape: BCT-SX series (Betacam SX cassette) (Sony’s standard products)
  Note
  For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.

Adjustment Items

Section	Item (Section title)		Adjustment point	Measurement point
4-5-2	Betacam SX format overall RF system adjustment		A17 : A11-A16 ALL ADJUST	(Automatic adjustments)
		Data save	A1F : NV-RAM CONTROL	

Refer to Section 4-5-3 in order to adjust the recording current only.

Section	Item (Section title)		Adjustment point	Remarks
4-5-3	Recording current adjustment		A12 : REC CURRENT	Automatic adjustment
		Data save	A1F : NV-RAM CONTROL	

4-5-2. Betacam SX Format Overall RF System Adjustment

Preparing tools

- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Alignment tape
  For DNW-75: SR5-1 (Part No. 8-960-075-01)
  For DNW-75P: SR5-1P(Part No. 8-960-075-51)
- Recording tape: BCT-SX series (Betacam SX cassette) (Sony's standard products)

  Note

  For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.

Preparation

1. Clean the video heads.

(Refer to "2-2-3. Tape Running Surface of Upper Drum and Video Heads Cleaning".)

Note

Perform the cleaning under the power off.

2. Check the settings of the sub control panel.

CHARACTER switch ⇨ ON
REC INHIBIT switch ⇨ OFF

3. Check that the VTR has warmed up.

Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.

Notice on the automatic adjustment

- Be sure not to touch the search dial and buttons which have an effect on tape running during the automatic adjustment mode. If tape running condition is changed, optimum adjustment can not be performed, the automatic adjustment operation may freeze, or the result of automatic adjustment become "FAIL" or "NG".
- If the adjustment with the automatic adjustment mode does not complete properly (an error message "Auto Adjust Failure" or "Condition NG" will be displayed on the video monitor), refer to "For Condition NG / Automatic Adjustment Failure" in Section 3-2-6.

Overall RF System Adjustment

1. Insert the alignment tape SR5-1 or SR5-1P, then search it in time code 00:03:00:00.
2. To enter the maintenance mode, press S1101 (L-1) of the SS-83 board.

PB system adjustment

3. Enter A17 : A11-A16 ALL ADJUST in the maintenance mode.
   - Message "Auto Adjust (Push SET)" is displayed on the video monitor.
4. To execute the automatic adjustments for PB system, press the SET button once on the lower control panel.
   - Message "Set a blank tape and press SET button for REC CURRENT adjustment" is displayed on the video monitor when the PB system adjustments are completed normally.
5. To eject the alignment tape, press the SET button once.
6. Take out this tape.

REC system adjustment (Rec. current adjustment)

7. Insert the recording tape.
8. To execute the automatic adjustment for the recording current, press the SET button once.
   - Message "Auto Adjust Complete" is displayed on the video monitor when this adjustment is completed normally.
9. To exit the maintenance mode, press the MENU button four times.
10. Eject the recording tape.

Data save (Store the adjusted data)

Note

Do not save the adjustment data if the automatic adjustments was not completed normally.

11. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
12. Enter A1F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
    - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

    Note

    When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
13. To exit the maintenance mode, press the MENU button four times.

4-5-3. Recording Current Adjustment

When the recording current adjustment is performed independently of the standard RF system alignment, be sure to see Section 4-5-3.
(Refer to Section "4-5-2. Betacam SX Format Overall RF System Adjustment" regarding the standard recording current adjustment in the RF system adjustment.)

Preparing tools

- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Cleaning tape: BCT-5CLN (Sony's standard products)
- Recording tape: BCT-SX series (Betacam SX cassette) (Sony's standard products)

  Note

  For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.

Preparation

1. Clean with the cleaning tape.

Insert the cleaning tape, and press the EJECT and PLAY buttons simultaneously.

- The EJECT button blinks and the PLAY button light. And the cleaning tape is played for about 5 seconds, before it is automatically ejected.

2. Check the settings of the sub control panel.

CHARACTER switch ⇨ ON
REC INHIBIT switch ⇨ OFF

3. Check that the VTR has warmed up.

Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.

Recording Current Adjustment

1. Insert the recording tape.
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A12 : REC CURRENT in the maintenance mode.
   - Message "Auto Adjust (Push SET)" is displayed on the video monitor.
4. Check that there is the ∗ mark to "ALL" on the video monitor.
   If not, set the ∗ mark to "ALL" with the search dial turned.
5. To execute the automatic adjustment for the recording current, press the SET button once on the lower control panel.
   - Message "Auto Adjust Complete" is displayed on the video monitor when this adjustment is completed normally.
6. To exit the maintenance mode, press the MENU button four times.
7. Eject the recording tape.

Data save (Store the adjusted data)

Note

Do not save the adjustment data if the automatic adjustments was not completed normally.

8. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
9. Enter A1F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".

10. To exit the maintenance mode, press the MENU button four times.

4-6. Audio System Adjustment (APR-40 Board)

4-6-1. Adjustment Overview

In the audio system alignment for the VTR need to adjust the analog audio system only. For the digital audio system is not needed.

Tools List

To perform the audio system alignment for the VTR, prepare the following equipment and fixtures.

- Audio signal generator: TEKTRONIX SG505-option 02 or equivalent
- Audio analyzer: TEKTRONIX AA501A-option 02 or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-555 (Part No. A-8277-211-A)
- Shorting clip
- Composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Adjustment Items

Section	Item (Section title)		Adjustment point	Measurement point
4-6-3	Analog audio output (Line) adjustment (APR-40 board)			
	Output level adjustment	CH1	⊘RV500/APR-40	AUDIO OUTPUT CH1
		CH2	⊘RV600/APR-40	AUDIO OUTPUT CH2
		CH3	⊘RV700/APR-40	AUDIO OUTPUT CH3
		CH4	⊘RV800/APR-40	AUDIO OUTPUT CH4
		L	⊘RV900/APR-40	MONITOR OUTPUT L
		R	⊘RV1000/APR-40	MONITOR OUTPUT R
4-6-4	Analog audio offset adjustment (APR-40 board)			
	Offset level adjustment	CH1	⊘RV103/APR-40	TP1113/APR-40
		CH2	⊘RV203/APR-40	TP1113/APR-40
		CH3	⊘RV303/APR-40	TP1114/APR-40
		CH4	⊘RV403/APR-40	TP1114/APR-40
4-6-5	Analog audio input adjustment (APR-40 board)			
	1. Input level adjustment	CH1	⊘RV100/APR-40, ⊘RV101/APR-40	AUDIO OUTPUT CH1
		CH2	⊘RV200/APR-40, ⊘RV201/APR-40	AUDIO OUTPUT CH2
		CH3	⊘RV300/APR-40, ⊘RV301/APR-40	AUDIO OUTPUT CH3
		CH4	⊘RV400/APR-40, ⊘RV401/APR-40	AUDIO OUTPUT CH4
	2. Distortion rate adjustment	CH4	⊘RV402/APR-40	AUDIO OUTPUT CH4
		CH3	⊘RV302/APR-40	AUDIO OUTPUT CH3
		CH2	⊘RV202/APR-40	AUDIO OUTPUT CH2
		CH1	⊘RV102/APR-40	AUDIO OUTPUT CH1

4-6-2. Common Preparation

Perform the settings (shorting plugs, control panels, setup menu, etc.) toward the VTR before starting the adjustments.
Return they settings to the customer settings after completing the audio system alignment.

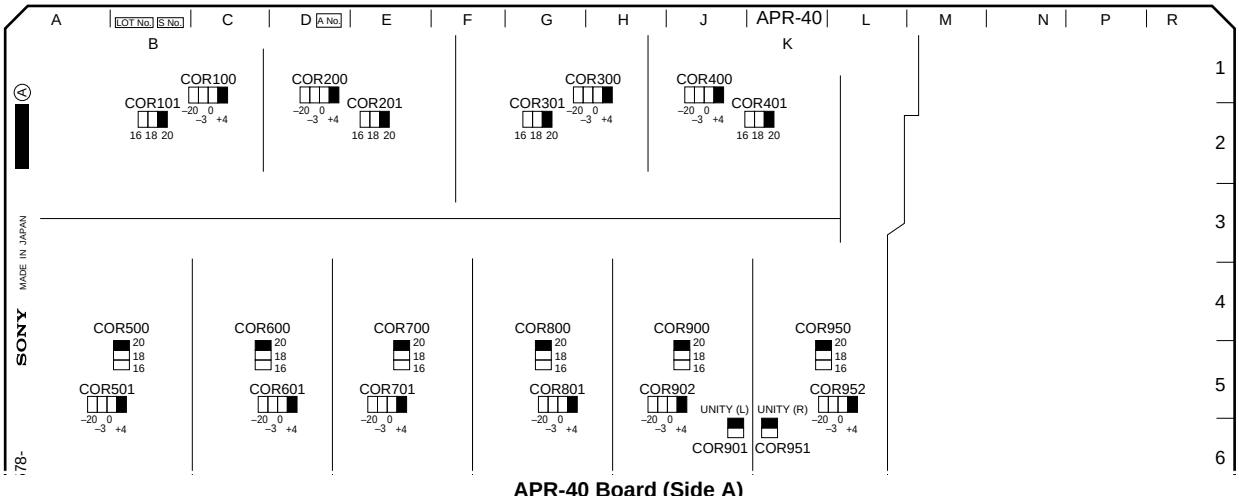
Shorting plugs setting

Reset the shorting plugs of APR-40 board to the factory settings.

Note

Turn off the power before removing the APR-40 board and changing the shorting plugs setting.

Ref. No. (Address)	Item	Customer setting	Factory setting
COR100 (C-1)	Analog audio CH1 input level	_____	⇨ +4
COR101 (B-2)	Analog audio CH1 input headroom	_____	⇨ 20
COR200 (D-1)	Analog audio CH2 input level	_____	⇨ +4
COR201 (E-2)	Analog audio CH2 input headroom	_____	⇨ 20
COR300 (H-1)	Analog audio CH3 input level	_____	⇨ +4
COR301 (G-2)	Analog audio CH3 input headroom	_____	⇨ 20
COR400 (J-1)	Analog audio CH4 input level	_____	⇨ +4
COR401 (K-2)	Analog audio CH4 input headroom	_____	⇨ 20
COR500 (B-5)	Analog audio CH1 output headroom	_____	⇨ 20
COR501 (B-5)	Analog audio CH1 output level	_____	⇨ +4
COR600 (C-5)	Analog audio CH2 output headroom	_____	⇨ 20
COR601 (D-5)	Analog audio CH2 output level	_____	⇨ +4
COR700 (E-5)	Analog audio CH3 output headroom	_____	⇨ 20
COR701 (E-5)	Analog audio CH3 output level	_____	⇨ +4
COR800 (G-5)	Analog audio CH4 output headroom	_____	⇨ 20
COR801 (G-5)	Analog audio CH4 output level	_____	⇨ +4
COR900 (J-5)	Monitor L output headroom	_____	⇨ 20
COR901 (J-5)	Monitor L output level, fixed or variable	_____	⇨ UNITY(L)
COR902 (H-5)	Monitor L output level	_____	⇨ +4
COR950 (K-5)	Monitor R output headroom	_____	⇨ 20
COR951 (K-5)	Monitor R output level, fixed or variable	_____	⇨ UNITY(R)
COR952 (K-5)	Monitor R output level	_____	⇨ +4



APR-40 Board (Side A)

2. Others settings

Location	Item		Customer setting	Setting at adjustment
SS-83 board	DIP switch S1100 (M-1) **Note** Set to ON to treat the extended menu of the setup menu.	No. 1		⇨ ON (Set to the up position)
Upper control panel	PB (audio level) controls	CH1		⇨ PRESET
		CH2		⇨ PRESET
		CH3		⇨ PRESET
		CH4		⇨ PRESET
	REC (audio level) controls	CH1		⇨ PRESET
		CH2		⇨ PRESET
		CH3		⇨ PRESET
		CH4		⇨ PRESET
	AUDIO INPUT SELECT			⇨ ANALOG/AES/EBU
	REMOTE	9P		⇨ Off (Light off)
		50P		⇨ Off (Light off)
Sub control panel	CHARACTER switch			⇨ ON
	KEY INHIBIT switch			⇨ OFF
Connector panel	AUDIO INPUT CH1 LEVEL switch			⇨ HIGH/ON 600Ω (Set to the right position.)
	AUDIO INPUT CH2 LEVEL switch			⇨ HIGH/ON 600Ω (Set to the right position.)
	AUDIO INPUT CH3 LEVEL switch			⇨ HIGH/ON 600Ω (Set to the right position.)
	AUDIO INPUT CH4 LEVEL switch			⇨ HIGH/ON 600Ω (Set to the right position.)

3. Video system check

Be sure to adjust in the following system.
DNW-75: 525/60 system
DNW-75P: 625/50 system

If differed, change the video system using the setup menu ITEM-013 before adjusting.
(For the ITEM-013, refer to Section 7-2-2 of the operation manual.)

4. Setup extended menu setting

Item	Customer setting	Setting at adjustment
817 : EMPHASIS		⇨ OFF

4-6-3. Analog Audio Output Line Adjustment

Preparing tools

- Audio analyzer:
  TEKTRONIX AA501A-option 02 or equivalent
- Extension board: EX-555 (Part No. A-8277-211-A)
- Analog composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check that the shorting plug settings on the APR-40 board are the factory settings.

(Refer to "Shorting plugs setting" in Section 4-6-2.)

2. Extend the APR-40 board with an extension board EX-555.

Note

After turning off the power, remove the APR-40 board.

3. Check the settings on the upper control panel.

PB (audio level) controls: All CHs ⇨ PRESET

4. Check the setting on the sub control panel.

CHARACTER switch ⇨ ON

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and audio analyzer through the power for 20 minutes or more.

Output Level Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. In C23 : AUDIO TEST SG of the maintenance mode, select "1KHz SINE 0VU" as test signal.
3. Set the audio analyzer as follows:
   Function mode: LEVEL, dBm (600 Ω)
   Input filter: 80 kHz LPF

CH1 adjustment

4. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
5. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV500/APR-40(B-5)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)

CH2 adjustment

6. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
7. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV600/APR-40(C-5)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)

CH3 adjustment

8. Connect the audio analyzer's input to AUDIO OUTPUT CH3 connector.
9. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV700/APR-40(F-5)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)

CH4 adjustment

10. Connect the audio analyzer's input to AUDIO OUTPUT CH4 connector.
11. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV800/APR-40(F-5)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)

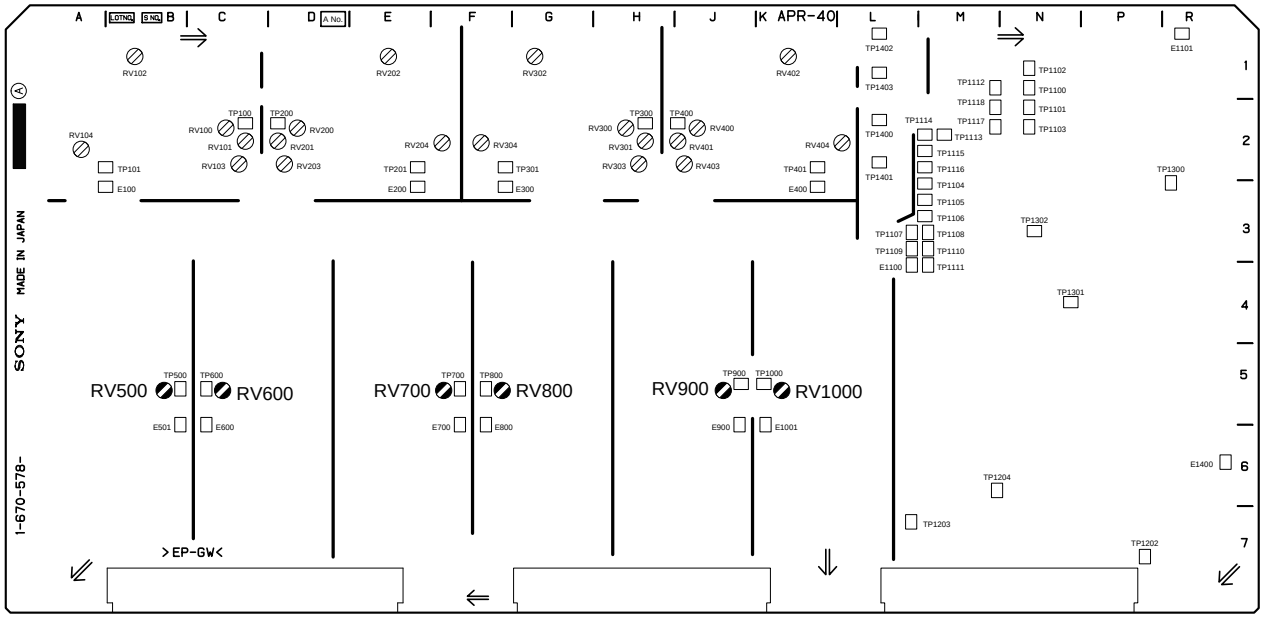
L channel adjustment

12. Connect the audio analyzer's input to MONITOR OUTPUT L connector.
13. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV900/APR-40(H-2)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)

R channel adjustment

14. Connect the audio analyzer's input to MONITOR OUTPUT R connector.
15. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV1000/APR-40(J-2)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)

16. To exit the maintenance mode, press the MENU button once.



APR-40 Board (Side A)

4-6-4. Analog Audio Offset Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-555 (Part No. A-8277-211-A)
- Shorting clip

Preparation

1. Check that the shorting plug settings on the APR-40 board are factory settings.

(Refer to "Shorting plugs setting" in Section 4-6-2.)

2. Extend the APR-40 board with an extension board EX-555.

Note

After turning off the power, remove the APR-40 board.

3. Check the settings on the upper control panel.

PB (audio level) controls: All CHs ⇨ PRESET

4. Check the setting of the setup extended menu.

ITEM-817 : EMPHASIS ⇨ OFF

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.

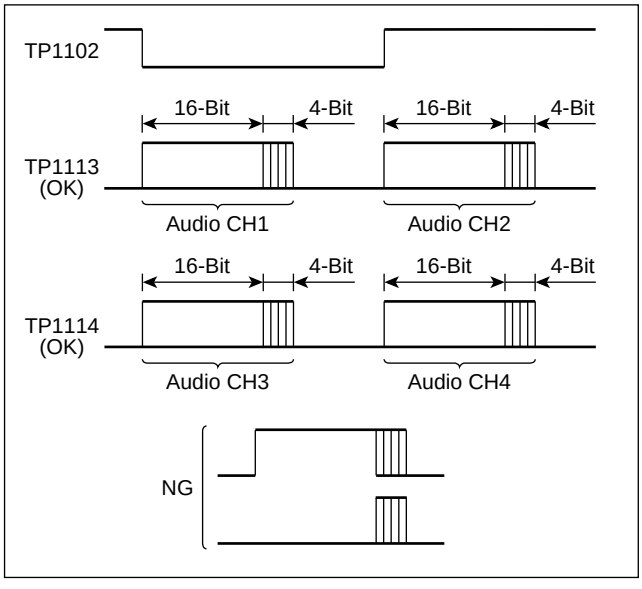


Figure 1. Waveform of Offset Level Adjustment

Offset Level Adjustment

CH1 adjustment

1. Short-circuit TP101(B-2) and E100(B-3) on the APR-40 board with a shorting clip.
2. Set and connect the oscilloscope as follows:
   Band width limit: ON (20 MHz)
   CH-1: TP1113/APR-40(M-2), DC 5 V/DIV
   GND: E1101/APR-40(R-1)
   CH-2: TP1102/APR-40(N-1), DC 5 V/DIV
   TIME: 2 μs/DIV
   TRIG: CH-2, − slope
3. Adjust so that audio CH1 part of the waveform at TP1113 makes the same waveform to the Figure 1 (left side).
   Adj. point: ⊘RV103/APR-40(C-2)
4. Remove the shorting clip on the APR-40 board.

CH2 adjustment

5. Short-circuit TP201(E-3) and E200(F-3) on the APR-40 board with a shorting clip.
6. Change the oscilloscope's trigger to the + slope.
7. Adjust so that audio CH2 part of the waveform at TP1113 makes the same waveform to the Figure 1 (right side).
   Adj. point: ⊘RV203/APR-40(D-2)
8. Remove the shorting clip on the APR-40 board.

CH3 adjustment

9. Short-circuit TP301(G-2) and E300(G-3) on the APR-40 board with a shorting clip.
10. Change the connection of the oscilloscope as follows:
    CH1: TP1114/APR-40(M-2)
11. Change the oscilloscope's trigger to the − slope.
12. Adjust so that audio CH3 part of the waveform at TP1114 makes the same waveform to the Figure 1 (left side).
    Adj. point: ⊘RV303/APR-40(H-2)
13. Remove the shorting clip on the APR-40 board.

CH4 adjustment

14. Short-circuit TP401(K-2) and E400(K-3) on the APR-40 board with a shorting clip.
15. Change the oscilloscope's trigger to the + slope.
16. Adjust so that audio CH4 part of the waveform at TP1114 makes the same waveform to the Figure 1 (right side).
    Adj. point: ⊘RV403/APR-40(J-2)
17. Remove the shorting clip on the APR-40 board.

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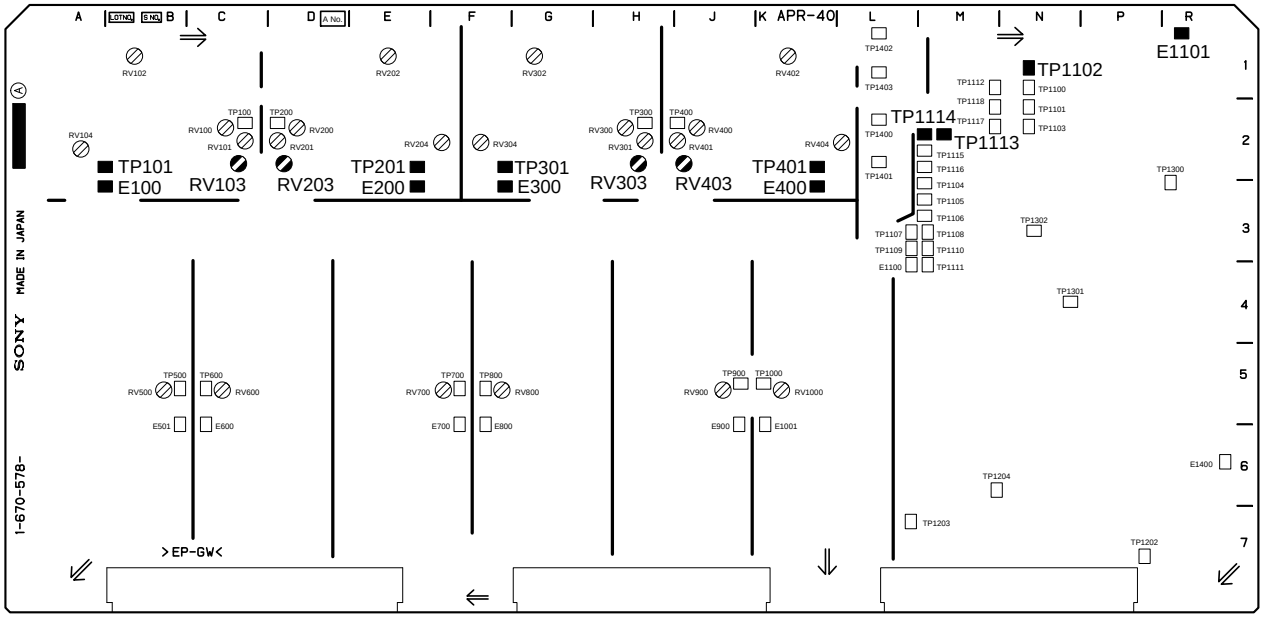


APR-40 Board (Side A)

4-6-5. Analog Audio Input Line Adjustment

Preparing tools

- Audio signal generator:
  TEKTRONIX SG505-option 02 or equivalent
- Audio analyzer:
  TEKTRONIX AA501A-option 02 or equivalent
- Extension board: EX-555 (Part No. A-8277-211-A)
- Shorting clip

Preparation

1. Check that the shorting plug settings on the APR-40 board are the factory settings.

(Refer to "Shorting plugs setting" in Section 4-6-2.)

2. Extend the APR-40 board with an extension board EX-555.

Note

After turning off the power, remove the APR-40 board.

3. Check the settings on the upper control panel.

PB (audio level) controls: All CHs ⇨ PRESET
REC (audio level) controls: All CHs ⇨ PRESET
AUDIO INPUT SELECT ⇨ ANALOG

4. Check the setting of the setup extended menu.

ITEM-817: EMPHASIS ⇨ OFF

5. Check the settings on the connector panel.

AUDIO INPUT LEVEL switches:
All CHs ⇨ HIGH/ON 600Ω (right position)

6. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. Input Level Adjustment

1. Set the audio analyzer as follows:
   Function mode: LEVEL, dBm (600 Ω)
   Input filter: 80 kHz LPF

CH1 adjustment

2. Short-circuit TP100(C-2) and E100(A-3) on the APR-40 board with the shorting clip.
3. Input the audio signal (1 kHz, +4.0 dBm) to AUDIO INPUT CH1 connector.
4. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
5. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV100/APR-40(C-2)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)
6. Remove the shorting clip on the APR-40 board.
7. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV101/APR-40(C-2)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)

CH2 adjustment

8. Short-circuit TP200(D-2) and E200(E-3) on the APR-40 board with a shorting clip.
9. Input the audio signal (1 kHz, +4.0 dBm) to AUDIO INPUT CH2 connector.
10. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
11. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV200/APR-40(D-2)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)
12. Remove the shorting clip on the APR-40 board.
13. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV201/APR-40(D-2)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)

CH3 adjustment

14. Short-circuit TP300(H-2) and E300(F-3) on the APR-40 board with a shorting clip.
15. Input the audio signal (1 kHz, +4.0 dBm) to AUDIO INPUT CH3 connector.
16. Connect the audio analyzer's input to AUDIO OUTPUT CH3 connector.
17. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV300/APR-40(H-2)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)
18. Remove the shorting clip on the APR-40 board.
19. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV301/APR-40(H-2)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)

CH4 adjustment

20. Short-circuit TP400(J-2) and E400(K-3) on the APR-40 board with a shorting clip.
21. Input the audio signal (1 kHz, +4.0 dBm) to AUDIO INPUT CH4 connector.
22. Connect the audio analyzer's input to AUDIO OUTPUT CH4 connector.
23. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV400/APR-40(J-2)
    Specification: +4.0 ± 0.1 dBm (at 600 Ω load)
24. Remove the shorting clip on the APR-40 board.
25. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV401/APR-40(J-2)
    Specification: +4.0 ± 0.1 dBm (at 600 Ω load)

2. Distortion Rate Adjustment

1. Set the audio analyzer as follows:
   Function mode: THD+N
   Range: 2%
   Input filter: 80 kHz LPF

CH4 adjustment

2. Input the audio signal (1 kHz, +23.5 dBm) to AUDIO INPUT CH4 connector.
3. Connect the audio analyzer's input to AUDIO OUTPUT CH4 connector.
4. Adjust the distortion rate on the audio analyzer.
   Adj. point: ⊘RV402/APR-40(K-1)
   Specification: Minimize (0.10% or less: OK)

CH3 adjustment

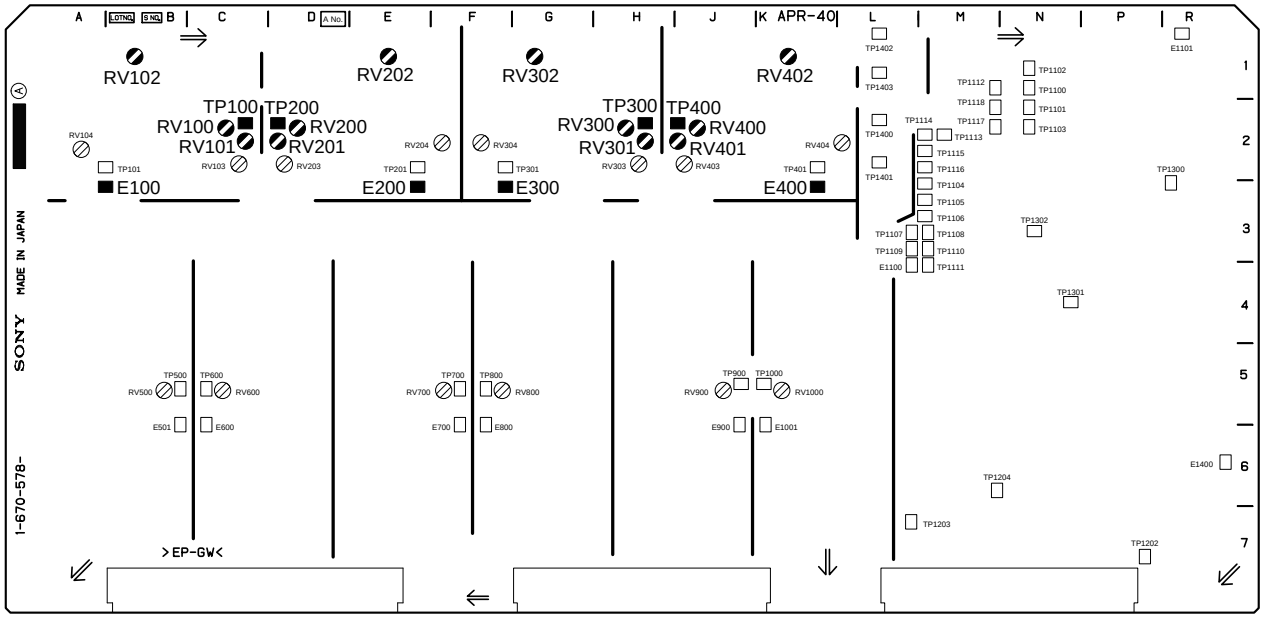
5. Input the audio signal (1 kHz, +23.5 dBm) to AUDIO INPUT CH3 connector.
6. Connect the audio analyzer's input to AUDIO OUTPUT CH3 connector.
7. Adjust the distortion rate on the audio analyzer.
   Adj. point: ⊘RV302/APR-40(G-1)
   Specification: Minimize (0.10% or less: OK)

CH2 adjustment

8. Input the audio signal (1 kHz, +23.5 dBm) to AUDIO INPUT CH2 connector.
9. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
10. Adjust the distortion rate on the audio analyzer.
    Adj. point: ⊘RV202/APR-40(E-1)
    Specification: Minimize (0.10% or less: OK)

CH1 adjustment

11. Input the audio signal (1 kHz, +23.5 dBm) to AUDIO INPUT CH1 connector.
12. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
13. Adjust the distortion rate on the audio analyzer.
    Adj. point: ⊘RV102/APR-40(B-1)
    Specification: Minimize (0.10% or less: OK)



APR-40 Board (Side A)

4-7. Video System Alignment (VPR-47 Board)

4-7-1. Adjustment Overview

Section 4-7 explains the alignment of the following in the video system.
- Reference signal system
- Video processing system
- Analog video output line

The adjustments are the manually adjustments using the menu of the maintenance mode.
When the VPR-47 board was replaced or repaired, perform the video system alignment.

Notes

- In the DNW-75, be sure to adjust in 525/60 system before 625/50 system.
  In the DNW-75P, be sure to adjust in 625/50 system before 525/60 system.
- In the video system alignment, be sure to adjust without the extension board.
- For the composite video input line and component video input line, refer to Section 4-8.

Note

For detail of each menu in the maintenance mode, refer to Section 3.

In Section 4-7, expresses the 525/60 and 625/50 systems as follows:

Video system	DNW-75	DNW-75P
525/60	Standard system	Another system
625/50	Another system	Standard system

Tools List

To perform the video system alignment for the VTR, prepare the following equipment and fixtures.

- Analog composite video signal generators (Sign is SG1.)
  - For 525/60 system: TEKTRONIX TSG-170A or equivalent
  - For 625/50 system: TEKTRONIX TSG-271 or equivalent
- Analog composite video signal generators (Sign is SG2.)
  - For 525/60 system: TEKTRONIX 1410 or equivalent
  - For 625/50 system: TEKTRONIX 1411 or equivalent
- Analog composite waveform/vector monitors
  - For 525/60 system: TEKTRONIX 1750, 1780R, or equivalent
  - For 625/50 system: TEKTRONIX 1751, 1781R, or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog component waveform monitor: TEKTRONIX WFM300 or equivalent
- Frequency counter: ADVANTEST TR5821AK or equivalent
- Analog composite video monitor (NTSC/PAL switchable type)

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- 75 Ω terminators (3 pieces)
- 75 Ω BNC T adapter

Adjustment Items

Section	Item	Adjustment point	Remarks
4-7-2	Preparation in standard system		DNW-75: 525/60 system DNW-75P: 625/50 system
4-7-3	Composite video output level adjustment		
	CH1/CH2	A20 : VPR VR : VIDEO 1/2 LEVEL	VIDEO OUTPUT COMPOSITE 1/2
	CH3	A20 : VPR VR : VIDEO 3 LEVEL	VIDEO OUTPUT COMPOSITE 3
	Data save	A2F : NV-RAM CONTROL	
4-7-4	Component video output adjustment		
	Y	A20 : VPR VR : Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT Y
	R-Y	A20 : VPR VR : R-Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT R-Y
	B-Y	A20 : VPR VR : B-Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT B-Y
	Data save	A2F : NV-RAM CONTROL	
	Output phase check		VIDEO OUTPUT COMPONENT
4-7-5	Component video output (Betacam) level adjustment		For 525/60 system only
	R-Y	A20 : VPR VR : B-CAM R-Y OUT LEVEL	VIDEO OUTPUT COMPONENT R-Y
	B-Y	A20 : VPR VR : B-CAM B-Y OUT LEVEL	VIDEO OUTPUT COMPONENT B-Y
	Data save	A2F : NV-RAM CONTROL	
4-7-6	Reference color frame pulse check		If the specification is not satisfied, change the adjustment data.
		A20 : VPR VR : REF 1st FLD DET	TP502/VPR-47(D-1)
	Data save	A2F : NV-RAM CONTROL	
4-7-7	Internal 4fsc frequency adjustment		
		A20 : VPR VR : INT 4Fsc FREQ	TP501/VPR-47(B-1)
	Data save	A2F : NV-RAM CONTROL	
4-7-8	Preparation in another system		DNW-75: 625/50 system DNW-75P: 525/60 system
4-7-9	Composite video output level adjustment		
	CH1/CH2	A20 : VPR VR : VIDEO 1/2 LEVEL	VIDEO OUTPUT COMPOSITE 1/2
	CH3	A20 : VPR VR : VIDEO 3 LEVEL	VIDEO OUTPUT COMPOSITE 3
	Data save	A2F : NV-RAM CONTROL	
4-7-10	Component video output adjustment		
	Y	A20 : VPR VR : Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT Y
	R-Y	A20 : VPR VR : R-Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT R-Y
	B-Y	A20 : VPR VR : B-Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT B-Y
	Data save	A2F : NV-RAM CONTROL	
	Output phase check		VIDEO OUTPUT COMPONENT
4-7-11	Component video output (Betacam) level adjustment		For DNW-75P only
	R-Y	A20 : VPR VR : B-CAM R-Y OUT LEVEL	VIDEO OUTPUT COMPONENT R-Y
	B-Y	A20 : VPR VR : B-CAM B-Y OUT LEVEL	VIDEO OUTPUT COMPONENT B-Y
	Data save	A2F : NV-RAM CONTROL	
4-7-12	Reference color frame pulse check		If the specification is not satisfied, change the adjustment data.
		A20 : VPR VR : REF 1st FLD DET	TP502/VPR-47(D-1)
	Data save	A2F : NV-RAM CONTROL	

Continue

Continued

Section	Item	Adjustment point	Remarks
4-7-13	Internal 4fsc frequency adjustment		
		A20 : VPR VR : INT 4Fsc FREQ	TP501/VPR-47(B-1)
	Data save	A2F : NV-RAM CONTROL	
4-7-14	Perfaction in video system alignment		

4-7-2. Preparation in Standard System

1. Set the VTR's switches as follows:

Location	Item	Customer setting		Setting at adjustment
SS-83 board	DIP switch S1100-1 (M-1) **Note** Set to ON to treat the extended menu of the setup menu.	_____	⇨	ON (Set to the up position)
Sub control panel	CHARACTER switch	_____	⇨	ON
	PROCESS CONTROL switch	_____	⇨	LOCAL
	• VIDEO switch	_____	⇨	PRESET
	• CHROMA switch	_____	⇨	PRESET
	• SETUP/BLACK LEVEL switch	_____	⇨	PRESET
	• CHROMA PHASE switch	_____	⇨	PRESET
Connector panel	REF. VIDEO 75 Ω switch	_____	⇨	OFF (Set to the down position)

2. Set the following mode of the analog composite monitor.
   DNW-75: NTSC
   DNW-75P: PAL
3. Check that the video system is setting as follows:
   DNW-75: 525/60 system
   DNW-75P: 625/50 system
   If differed, change the video system in the setup menu ITEM-013 before adjusting.
   (For the ITEM-013, refer to Section 7-2-2 of the operation manual.)
4. For the DNW-75 only:
   Set the ITEM-709 and -713 in the setup extended menu as follows:

ITEM No.	SUB-ITEM	Customer setting		Setting at adjustment
709 : CAV LEVEL FORMAT	1. OUTPUT CAV LEVEL	_____	⇨	B-CAM
713 : VIDEO SETUP REFERENCE LEVEL	0. MASTER LEVEL	_____	⇨	0.0%
	4. OUTPUT LEVEL	_____	⇨	MSTER

5. When extending the VPR-47 board with an extension board, stop the extending.
   Note
   If stopping the extension to the VPR-47 board, turn off the power, then remove the VPR-47 board.

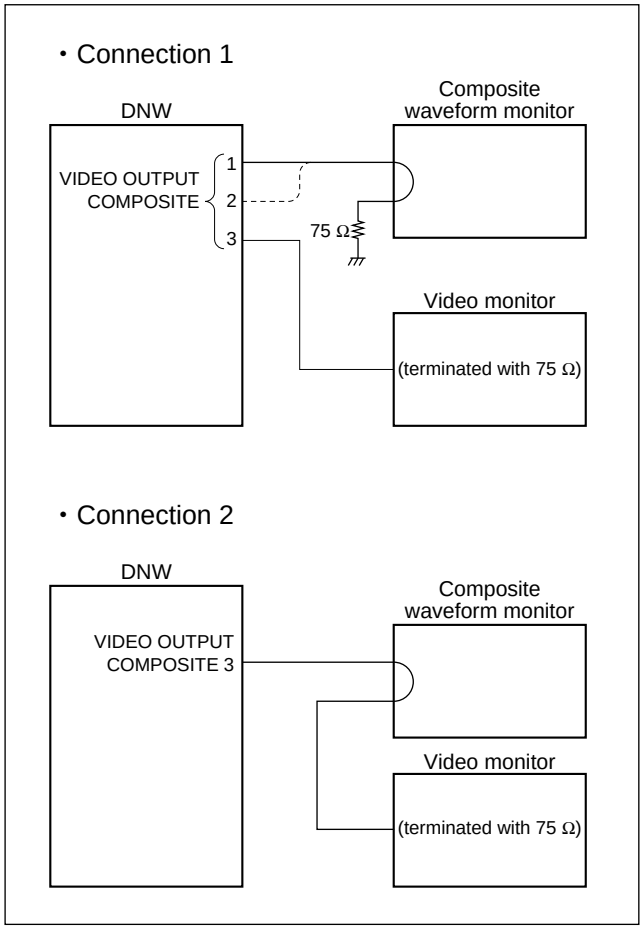
4-7-3. Composite Video Output Adjustment (Standard System)

Note

For the composite video output adjustment in the another system, refer to Section 4-7-9.

Preparing tools

- Analog composite waveform monitor
  For DNW-75:
  TEKTRONIX 1750, 1780R, or equivalent
  For DNW-75P:
  TEKTRONIX 1751, 1781R, or equivalent
- Analog composite video monitor
  Note
  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector otherwise note.
- 75 Ω terminator



Connections

Preparation

1. Check the switch setting on the SS-83 board.
S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.
CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SETUP/BLACK LEVEL switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the analog composite waveform monitor as shown Connection 1 on Figure "Connections".

4. Check the setup extend menu setting. (For the DNW-75 only)
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
4. OUTPUT LEVEL ⇨ MSTER

5. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and composite waveform monitor through the power for 30 minutes or more.

Output Level Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the following test signal.
   DNW-75: 75% Color Bars
   DNW-75P: 100% Color Bars
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Enter A20 : VPR VR.

Check (Adjustment)

5. Connect the analog composite waveform monitor to each VIDEO OUTPUT COMPOSITE connector, then check the white peak level.
   If the specification is not satisfied, perform the adjustment.

   Notes
   - The outputs of VIDEO OUTPUT COMPOSITE 1 and 2 connectors cannot adjust separately.
   - When checking/adjusting the output of VIDEO OUTPUT COMPOSITE 3 (SUPER) connector, change the connection of the video monitor as Connection 2 on the opposite page.
   - The menu picture of the maintenance mode is superimposed in the output of VIDEO OUTPUT COMPOSITE 3 (SUPER) connector. If the superimposed picture obstructs, set the CHARACTER switch on the sub control panel to OFF. (Be sure to return it to ON after checking/adjusting.)

6. To exit A20 : VPR VR, press the MENU button once.

Data save (Store the adjusted data)

When the adjustment was not performed in step 5, skip over to step 9.

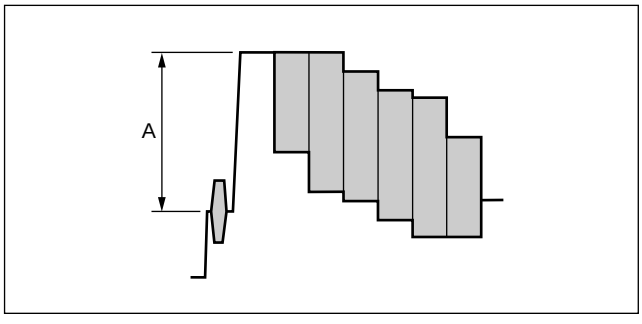
7. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

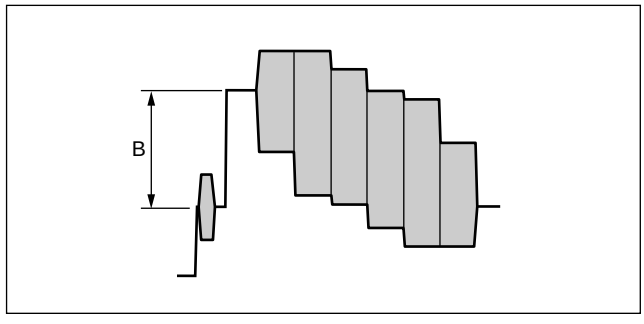
   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
8. To exit A2F : NV-RAM CONTROL, press the MENU button once.

9. To exit the maintenance mode, press the MENU button three times.

Output channel [Connection]	Adjustment point (A20 : VPR VR)	Specification DNW-75	DNW-75P
COMPOSITE 1 [Connection 1]	VIDEO 1/2 LEVEL	A = 100 ±1 IRE	B = 700 ±7 mV
COMPOSITE 2 [Connection 1]	VIDEO 1/2 LEVEL	(A = 714 ±7 mV)	
COMPOSITE 3 [Connection 2]	VIDEO 3 LEVEL		



DNW-75 (525/60 System)



DNW-75P (625/50 System)

4-7-4. Component Video Output Adjustment (Standard System)

Note

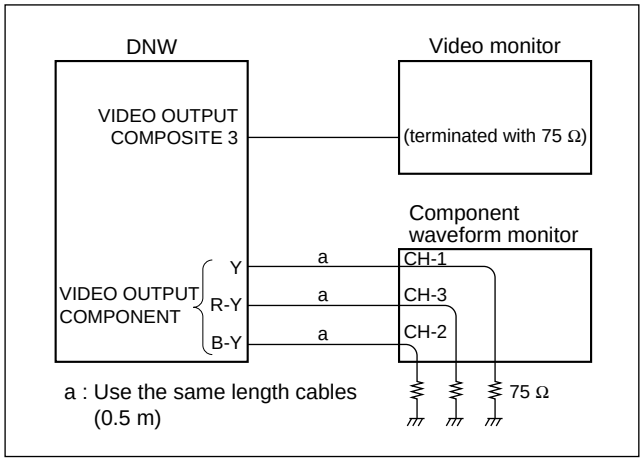
For the composite video output adjustment in the another system, refer to Section 4-7-10.

Preparing tools

- Analog component waveform monitor
  TEKTRONIX WFM300 or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- 75 Ω terminators (3 pieces)



Connection

Preparation

1. Check the switch setting on the SS-83 board.

S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SETUP/BLACK LEVEL switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the analog component waveform monitor as shown Figure "Connection".

4. Check the setup extend menu settings. (For the DNW-75 only)

ITEM-709 : CAV LEVEL FORMAT
  1. OUTPUT CAV LEVEL ⇨ D-1
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
  0. MASTER LEVEL ⇨ 0.0%
  4. OUTPUT LEVEL ⇨ MSTER

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and component waveform monitor through the power for 30 minutes or more.

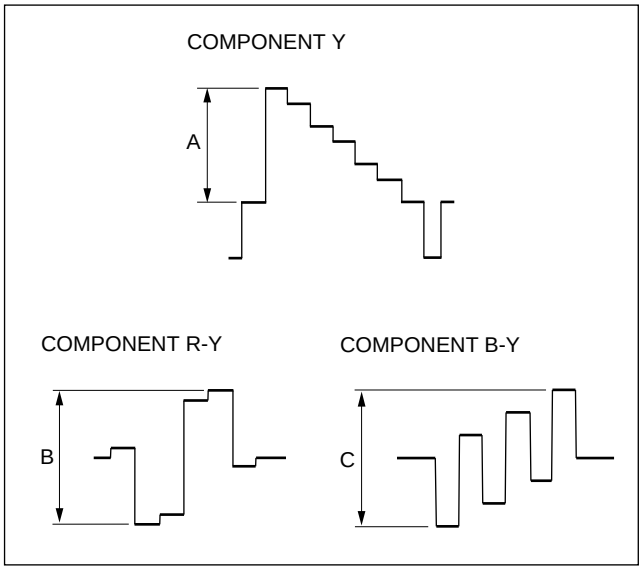
1. Output Level Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the test signal “100% Color Bars”.
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Enter A20 : VPR VR.

Check (Adjustment)

5. Check each specified part’s level of VIDEO OUTPUT COMPONENT outputs on the waveform monitor. If the specification is not satisfied, perform the adjustment.

Output	Adj. point (A20 : VPR VR)	Specification
Y	Y OUTPUT LEVEL	A = 700 ±7 mV
R-Y	R-Y OUTPUT LEVEL	B = 700 ±7 mV p-p
B-Y	B-Y OUTPUT LEVEL	C = 700 ±7 mV p-p



6. To exit A20 : VPR VR, press the MENU button once.

Data save (Store the adjusted data)

When the adjustment was not performed in step 5, skip over steps 7 and 8.

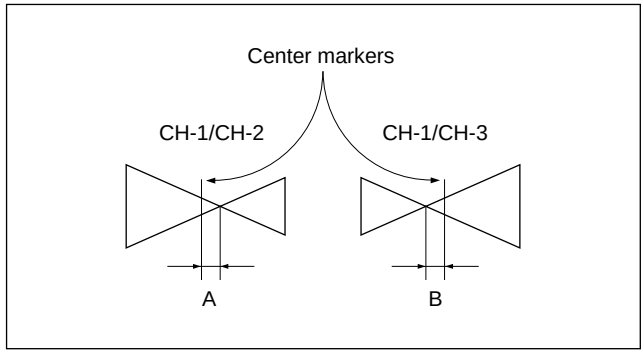
7. Enter A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
8. To exit A2F : NV-RAM CONTROL, press the MENU button once.

2. Output Phase Check

1. To exit the A2 : AUDIO/VIDEO ADJUST, press the MENU button once.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the test signal “Bowtie”.
3. Set the analog component waveform monitor to the BOWTIE mode.
4. Check the deviations A and B between each center marker and bowtie dip point of CH-1/CH-2 (Y/B-Y) and CH-1/CH-3 (Y/R-Y).
   Specifications: A = 0 ± 10 ns
   B = 0 ± 10 ns



5. To exit the maintenance mode, press the MENU button four times.

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4-7-5. Component Video Output (Betacam) Adjustment (525/60 System)

Notes

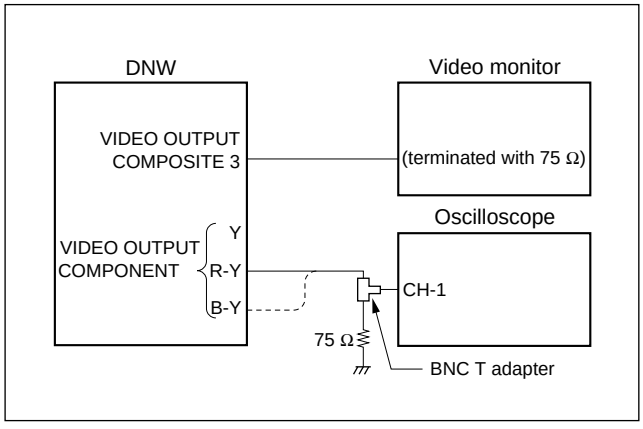
- Be sure to perform this adjustment when the VTR operates in the 525/60 system.
- For the DNW-75P, be sure to perform this adjustment after Section 4-7-10 is completed.

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- 75 Ω terminator
- 75 Ω BNC T adapter



Connection

Preparation

1. Check the switch setting on the SS-83 board.

S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SETUP/BLACK LEVEL switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the oscilloscope as shown Figure "Connection".

4. Check the setup extend menu settings.

ITEM-709 : CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
0. MATER LEVEL ⇨ 0.0%
4. OUTPUT LEVEL ⇨ MSTER

5. Check that the equipment has warmed up.

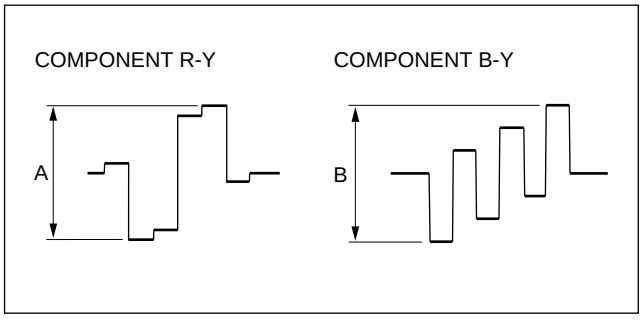
Before starting the adjustment, warm up the VTR and oscilloscope through the power for 30 minutes or more.

Output Level Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the test signal “75% Color Bars”.
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Enter A20 : VPR VR.

Check (Adjustment)

5. Set the oscilloscope as follows:
   Band width limit: ON (20 MHz)
   CH-1: DC 100 mV/DIV
   TIME: 10 μs/DIV
   TRIG: CH-1
6. Connect the oscilloscope’s CH-1 input to VIDEO OUTPUT COMPONENT R-Y connector, then check the output level.
   If the specification is not satisfied, perform the adjustment.
   Adj. point: A20 : VPR VR : R-Y OUTPUT LEVEL
   Specification: A = 757 ±7 mV p-p
7. Connect the oscilloscope’s CH-1 input to VIDEO OUTPUT COMPONENT B-Y connector, then check the output level.
   If the specification is not satisfied, perform the adjustment.
   Adj. point: A20 : VPR VR : B-Y OUTPUT LEVEL
   Specification: B = 757 ±7 mV p-p



8. To exit A20 : VPR VR, press the MENU button once.

Data save (Store the adjusted data)

When the adjustment was not performed in both step 6 and step 7, skip over to step 11.

9. Enter A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
10. To exit A2F : NV-RAM CONTROL, press the MENU button once.

11. To exit the maintenance mode, press the MENU button three times.

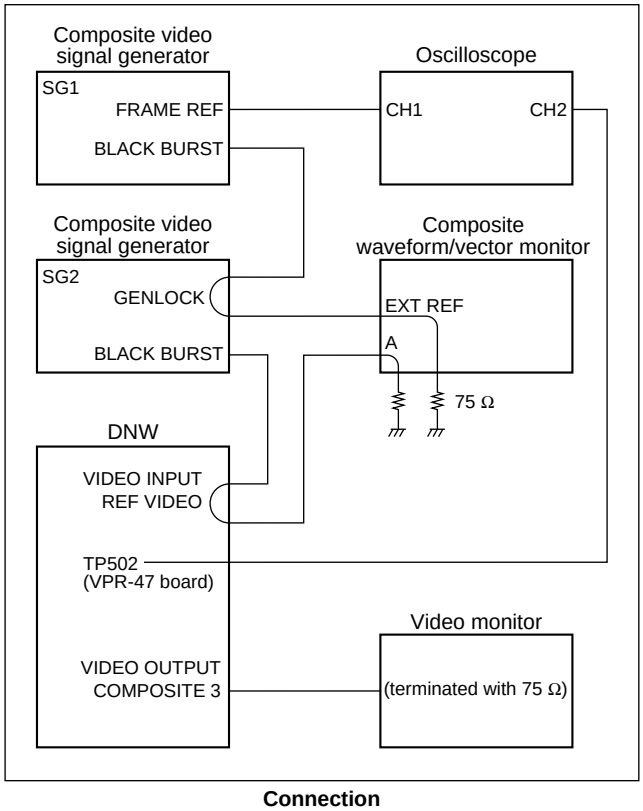
4-7-6. Reference Color Frame Pulse Check (Standard System)

Note

For the reference color frame pulse check in another system, refer to Section 4-7-12.

Preparing tools

- Analog composite video signal generator (Sign is SG1.)
  For DNW-75: TEKTRONIX TSG-170A or equivalent
  For DNW-75P: TEKTRONIX TSG-271 or equivalent
- Analog composite video signal generator (Sign is SG2.)
  For DNW-75: TEKTRONIX 1410 or equivalent
  For DNW-75P: TEKTRONIX 1411 or equivalent
- Analog composite waveform/vector monitor
  For DNW-75: TEKTRONIX 1750, 1780R, or equivalent
  For DNW-75P: TEKTRONIX 1751, 1781R, or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor
- 75 Ω terminators (2 pieces)



Connection

Preparation

1. Check the setting on the sub control panel.
CHARACTER switch ⇨ ON

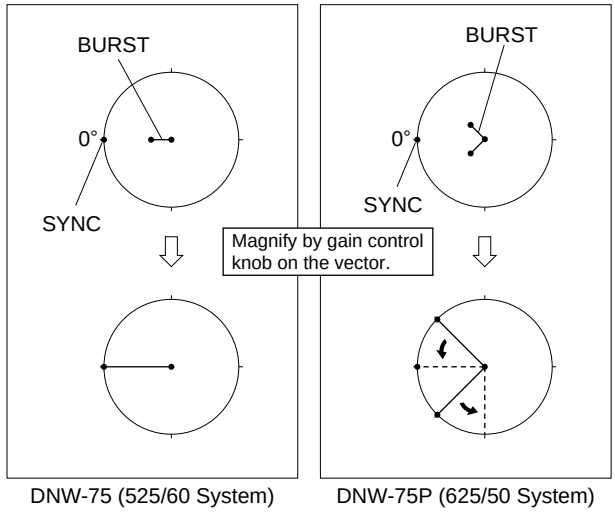
2. Connect the equipment as shown Figure "Connection".

3. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and other equipment through the power for 30 minutes or more.

Setting of Composite Waveform/Vector Monitor

In this section, the analog composite waveform/vector monitor is abbreviated "vector" for short.

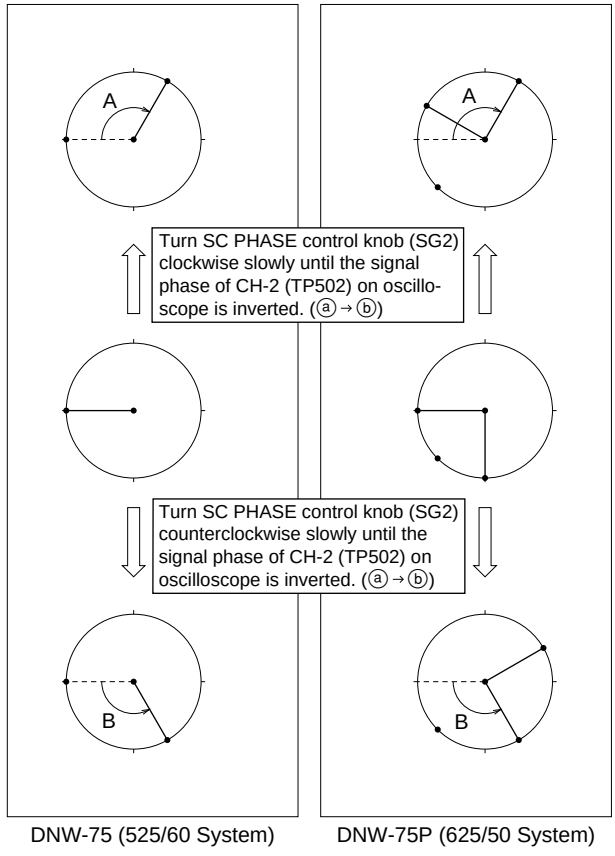
1. Set the vector as follows:
   SCH mode, INPUT: CH-A, EXT REF
2. Align the SYNC phase to 0 degree using the vector's PHASE knob so that the beam spot (SYNC) moves in the shortest route. (Refer to below figure.)
3. Align the BURST to regular potion on the vector using the signal generator SG2's SC PHASE knob.
4. Align the BURST's beam spot(s) to the circle scale on the vector using the gain control (knob) on the vector.
5. For DNW-75P only
   Align the BURST to the specified positions as the dotted lines of right figure using the vector's PHASE knob.

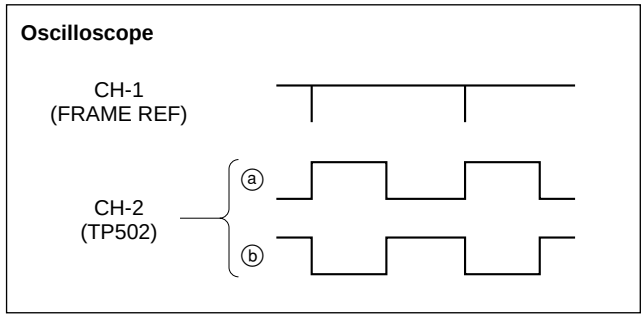


DNW-75 (525/60 System) DNW-75P (625/50 System)

Reference Color Frame Pulse Check

1. To enter the maintenace mode, press S1101(L-1) on the SS-83 board.
2. Enter A20: VPR VR.
3. Connect and set the oscilloscope as follows:
   ALT display mode
   CH-2: TP502/VPR-47(D-1), DC 2 V/DIV
   GND: E501/VPR-47(D-1)
   TIME: 10 ms/DIV for DNW-75
   20 ms/DIV for DNW-75P
   TRIG: CH-1: DC 2 V/DIV
   (Connected SG2's FRAME REF output)
4. Turn the signal generator SG2's SC PHASE control knob clockwise (↻) slowly until the waveform of the oscilloscope's CH-2 (TP502) changes from ⓐ to ⓑ.
5. Measure the BURST phase (angle A) on the vector when just inverted the phase of CH-2 (TP502) on the oscilloscope.
6. To return the position of the BURST signal to be displayed on the vector, turn SG2's SC PHASE control knob counterclockwise (↺).
7. Turn the signal generator SG2's SC PHASE control knob counterclockwise (↺) slowly until the waveform of the oscilloscope's CH-2 (TP502) changes from ⓐ to ⓑ.
8. Measure the BURST phase (angle B) on the vector when just inverted the phase of CH-2 (TP502) on the oscilloscope.
9. To return the position of the BURST signal to be displayed on the vector, turn SG2's SC PHASE control knob clockwise (↻).
10. Confirm that the difference between the angles A and B is within specification.
    If the specification is not satisfied, perform steps (1) through (4).
    Specification: A − B = 0 ±10°
11. To exit the A20 : VPR VR, press the MENU button once.


A
A
Turn SC PHASE control knob (SG2) clockwise slowly until the signal phase of CH-2 (TP502) on oscilloscope is inverted. (ⓐ→ⓑ)
Turn SC PHASE control knob (SG2) counterclockwise slowly until the signal phase of CH-2 (TP502) on oscilloscope is inverted. (ⓐ→ⓑ)
B
B
DNW-75 (525/60 System)
DNW-75P (625/50 System)



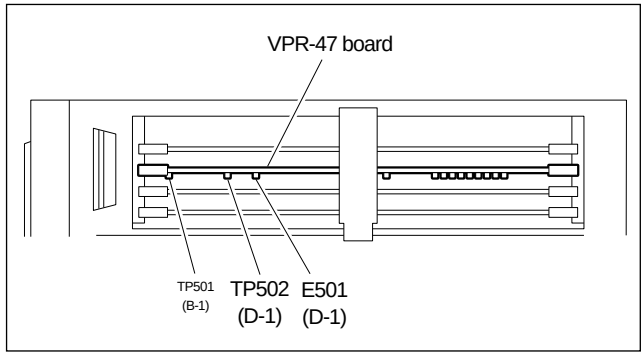
Perform following steps (1) and (2) when the specification in step 10 was not satisfied.

(1) Add/subtract 1 to/from the data value of "REF 1ST FLD DET".

Note

The data increase/decrease is dependent on the angles A and B measured in steps 5 and 8.
A > B : Subtract 1 from the data value.
A < B : Add 1 to the data value.

(2) Return to step 4.



Data save (Store the adjusted data)

Perform following steps 12 and 13 when the data of "REF 1ST FLD DET" in A20 : VPR VR was changed.

12. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
    - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

    Note

    When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
13. To exit A2F : NV-RAM CONTROL, press the MENU button once.

4-7-7. Internal 4fsc Frequency Adjustment (Standard System)

Note

For the internal 4fsc frequency adjustment in another system, refer to Section 4-7-13.

Preparing tools

- Frequency counter:
  ADVANTEST TR5821AK or equivalent
- Analog composite video monitor
  (NTSC/PAL switchable type)

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check the setting on the sub control panel.

CHARACTER switch ⇨ ON

2. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and frequency counter through the power for 30 minutes or more.button three times.

Frequency Adjustment

1. Supply no signal to REF. VIDEO connector. (or non connection)
2. Connect the frequency counter to TP501(B-1) on the VPR-47 board. GND: E501/VPR-47(D-1)
3. Enter A20 : VPR VR.
4. Adjust the frequency on the frequency counter.
   Adj. point: A20 : VPR VR : INT 4FSC FREQ
   Specification:
   14,318,181 ±50 Hz for DNW-75
   17,734,476 ±50 Hz for DNW-75P
5. To exit A20 : VPR VR, press the MENU button once.

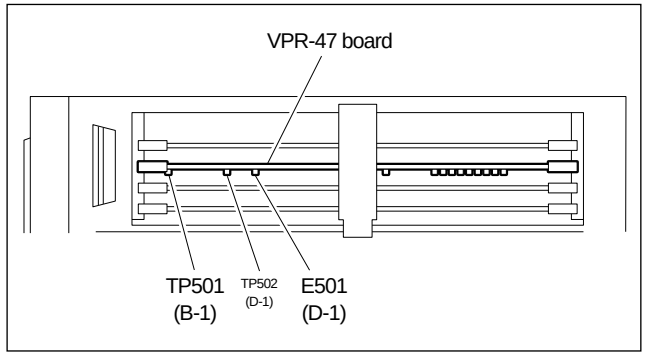
Data save (store the adjusted data)

6. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
7. To exit A2F : NV-RAM CONTROL, press the MENU button once.

8. To exit the maintenance mode, press the MENU button three times.



4-7-8. Preparation in Another System

Notes

- Be sure to perform the adjustments in the another system after completing the adjustments in the standard system.
- The settings of the VTR's switches are the same as the Preparation in standard system.

For the DNW-75

1. Return the following SUB-ITEM settings of the ITEM-709 and -723 in the setup extend menu to the customer settings. (Refer to step 3 in Section 4-7-2.)
   - 709 : CAV LEVEL FORMAT
     1. OUTPUT CAV LEVEL
   - 713 : VIDEO SETUP REFERENCE LEVEL
     0. MASTER LEVEL
     4. OUTPUT LEVEL
2. Turn the video system to a 625/50 system using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 of the operation manual.)
3. Set the analog composite monitor to the PAL mode.

For the DNW-75P

1. Turn the video system to a 525/60 system using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 of the operation manual.)
2. Set the analog composite monitor to the NTSC mode.
3. Set the ITEM-709 and -713 in the setup extended menu as follows:

ITEM No. SUB-ITEM	Customer setting		Setting at adjustment
709 : CAV LEVEL FORMAT			
1. OUTPUT CAV LEVEL	_____	⇨	B-CAM
713 : VIDEO SETUP REFERENCE LEVEL			
0. MASTER LEVEL	_____	⇨	0.0%
4. OUTPUT LEVEL	_____	⇨	MSTER

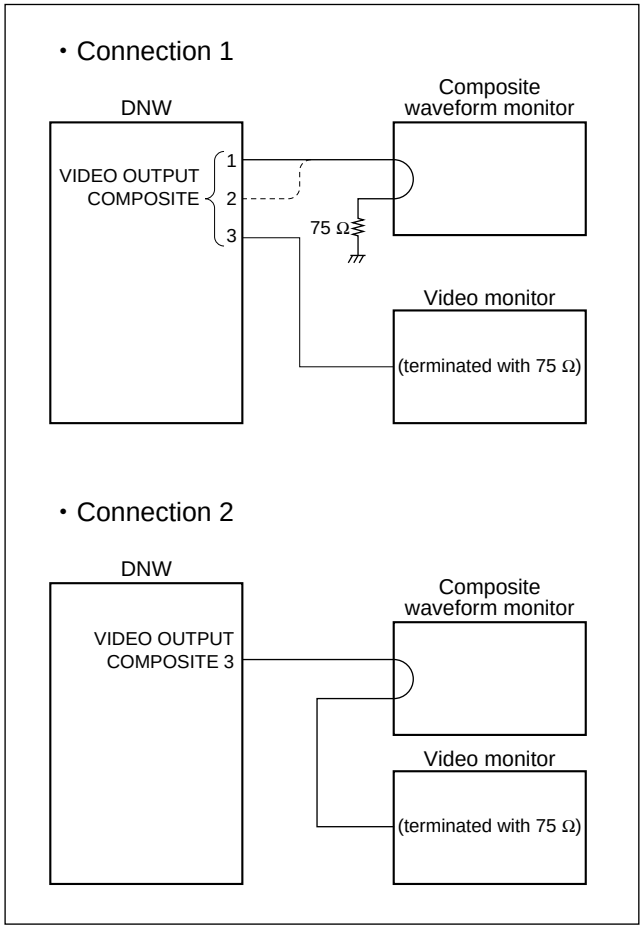
4-7-9. Composite Video Output Adjustment (Another System)

Note

For the composite video output adjustment in the standard system, refer to Section 4-7-3.

Preparing tools

- Analog composite waveform monitor
  For DNW-75:
  TEKTRONIX 1751, 1781R or equivalent
  For DNW-75P:
  TEKTRONIX 1750, 1780R or equivalent
- Analog composite video monitor
  Note
  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector otherwise note.
- 75 Ω terminator



Connections

Preparation

1. Check the switch setting on the SS-83 board.
S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.
CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SETUP/BLACK LEVEL switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the analog composite monitor as shown Connection 1 on Figure "Connections".

4. Check the setup extend menu setting. (For the DNW-75P only)
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
4. OUTPUT LEVEL ⇨ MSTER

5. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and oscilloscope through the power for 30 minutes or more.

Output Level Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the following test signal.
   DNW-75: 100% Color Bars
   DNW-75P: 75% Color Bars
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Enter A20 : VPR VR.

Check (Adjustment)

5. Connect the analog composite waveform monitor to each VIDEO OUTPUT COMPOSITE connector, then check the white peak level.
   If the specification is not satisfied, perform the adjustment.

   Notes
   - The outputs of VIDEO OUTPUT COMPOSITE 1 and 2 connectors cannot adjust separately.
   - When checking/adjusting the output of VIDEO OUTPUT COMPOSITE 3 (SUPER) connector, change the connection of the video monitor as Connection 2 on the opposite page.
   - The menu picture of the maintenance mode is superimposed in the output of VIDEO OUTPUT COMPOSITE 3 (SUPER) connector. If the superimposed picture obstructs, set the CHARACTER switch on the sub control panel to OFF. (Be sure to return it to ON after checking/adjusting.)

6. To exit A20 : VPR VR, press the MENU button once.

Data save (Store the adjusted data)

When the adjustment in step 5 was not performed, skip over to step 9.

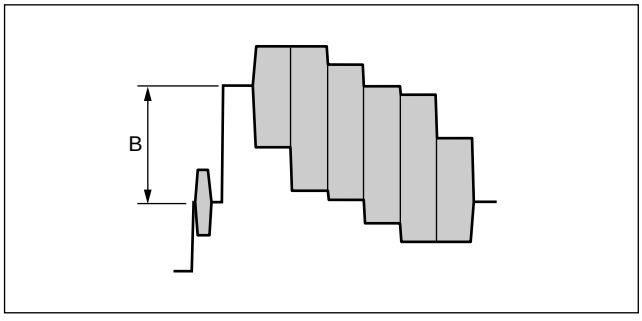
7. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

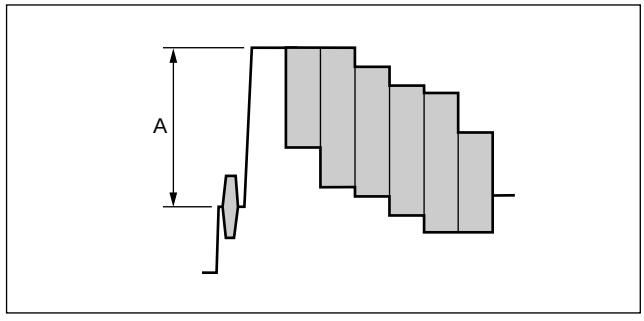
   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
8. To exit A2F : NV-RAM CONTROL, press the MENU button once.

9. To exit the maintenance mode, press the MENU button three times.

	Adjustment point	Specification	
Output channel [Connection]	**(A20 : VPR VR)**	**DNW-75**	**DNW-75P**
COMPOSITE 1 [Connection 1]	VIDEO 1/2 LEVEL	B = 700 ±7 mV	A = 100 ±1 IRE
COMPOSITE 2 [Connection 1]	VIDEO 1/2 LEVEL		(A = 714 ±7 mV)
COMPOSITE 3 [Connection 2]	VIDEO 3 LEVEL		



DNW-75 (625/50 System)



DNW-75P (525/60 System)

4-7-10. Component Video Output Adjustment (Another System)

Note

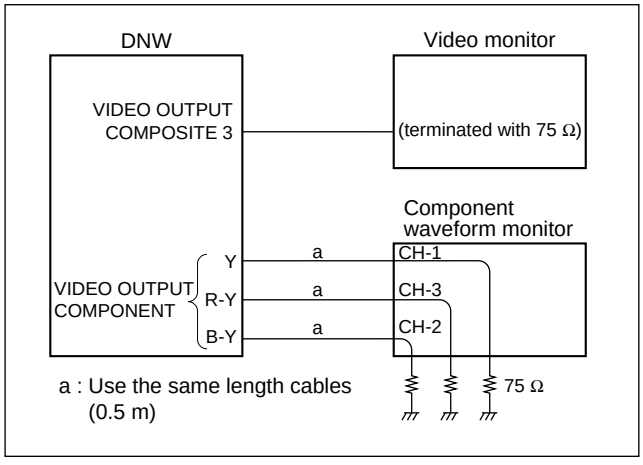
For the composite video output adjustment in the standard system, refer to Section 4-7-4.

Preparing tools

- Analog component waveform monitor
  TEKTRONIX WFM300 or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector on the connector panel.
- 75 Ω terminators (3 pieces)



Connection

Preparation

1. Check the switch setting on the SS-83 board.

S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SETUP/BLACK LEVEL switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the analog component waveform monitor as shown Figure "Connection".

4. Check the setup extend menu settings. (For the DNW-75P only)

ITEM-709 : CAV LEVEL FORMAT
  1. OUTPUT CAV LEVEL ⇨ D-1
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
  4. OUTPUT LEVEL ⇨ 0.0%

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and component waveform monitor through the power for 30 minutes or more.

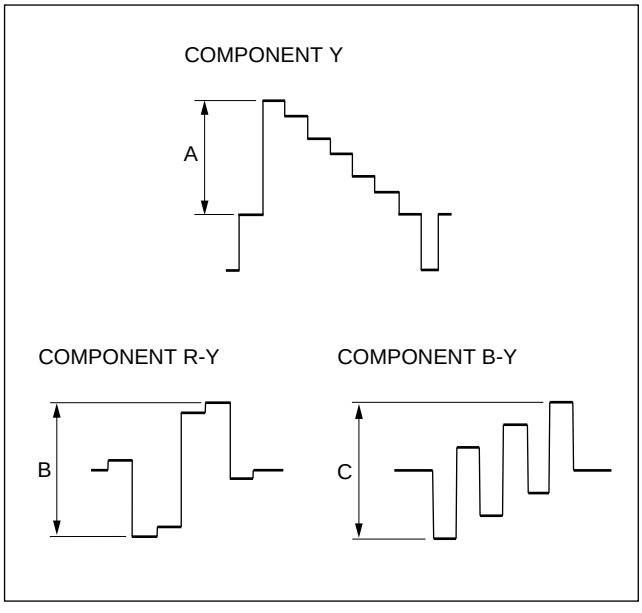
Output Level Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the test signal “100% Color Bars”.
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Enter A20 : VPR VR.

Check (Adjustment)

5. Check each specified part’s level of VIDEO OUTPUT COMPONENT outputs (Y/R-Y/B-Y) on the waveform monitor.
   If the specification is not satisfied, perform the adjustment.

Output	Adj. point (A20 : VPR VR)	Specification
Y	Y OUTPUT LEVEL	A = 700 ±7 mV
R-Y	R-Y OUTPUT LEVEL	B = 700 ±7 mV p-p
B-Y	B-Y OUTPUT LEVEL	C = 700 ±7 mV p-p



6. To exit A20 : VPR VR, press the MENU button once.

Data save (Store the adjusted data)

When the adjustment was not performed in step 5, skip over to step 9.

7. Enter A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
8. To exit A2F : NV-RAM CONTROL, press the MENU button once.

9. To exit the maintenance mode, press the MENU button three times.

4-7-11. Component Video Output (Betacam) Adjustment (for DNW-75P only in 525/60 System)

For the component video output (Betacam) adjustment to DNW-75P under 525/60 system, perform Section 4-7-5.

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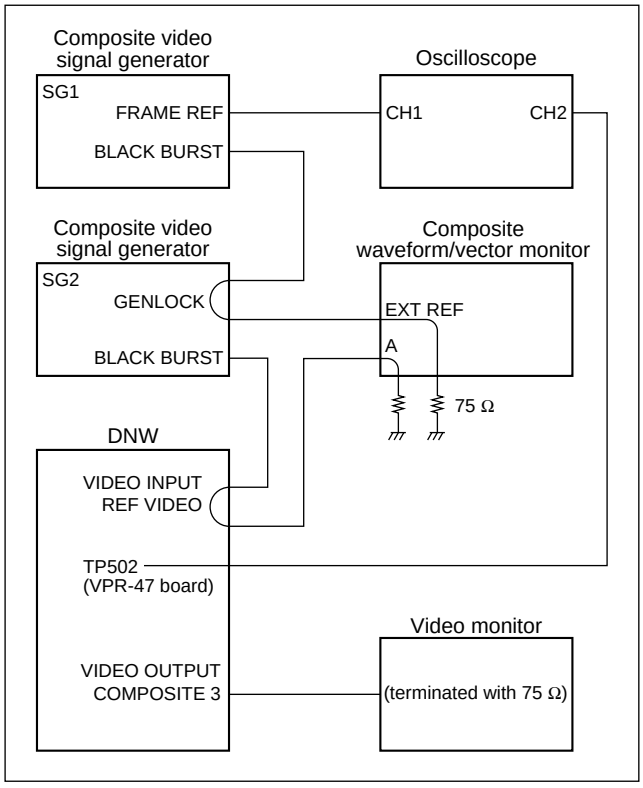
4-7-12. Reference Color Frame Pulse Check (Another System)

Note

For the reference color frame pulse check in standard system, refer to Section 4-7-6.

Preparing tools

- Analog composite video signal generator (Sign is SG1.)
  For DNW-75: TEKTRONIX TSG-271 or equivalent
  For DNW-75P: TEKTRONIX TSG-170A or equivalent
- Analog composite video signal generator (Sign is SG2.)
  For DNW-75: TEKTRONIX 1411 or equivalent
  For DNW-75P: TEKTRONIX 1410 or equivalent
- Analog composite waveform/vector monitor
  For DNW-75: TEKTRONIX 1751, 1781R, or equivalent
  For DNW-75P: TEKTRONIX 1750, 1780R, or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor
- 75 Ω terminators (2 pieces)



Connection

Preparation

1. Check the setting on the sub control panel.
CHARACTER switch ⇨ ON

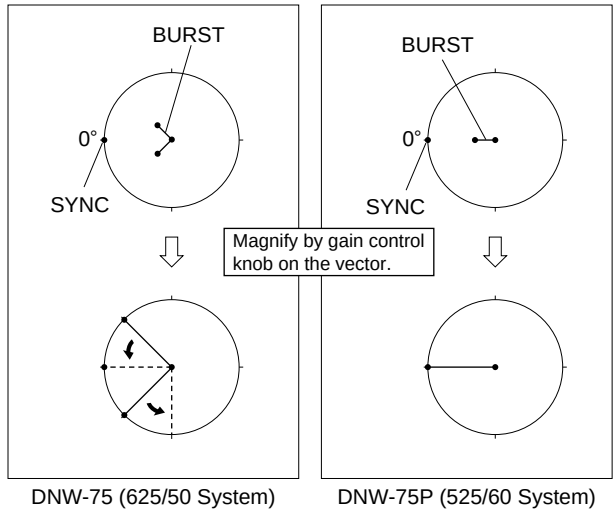
2. Connect the equipment as shown Figure "Connection".

3. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and other equipment through the power for 30 minutes or more.

Setting of Composite Waveform/Vector Monitor

In this section, the analog composite waveform/vector monitor is abbreviated "vector" for short.

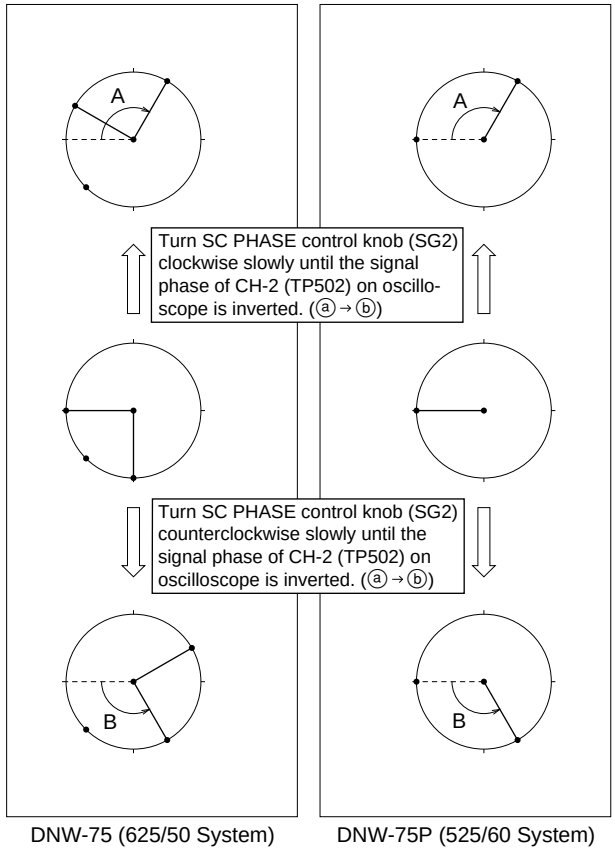
1. Set the vector as follows:
   SCH mode, INPUT: CH-A, EXT REF
2. Align the SYNC phase to 0 degree using the vector's PHASE knob so that the beam spot (SYNC) moves in the shortest route. (Refer to below figure.)
3. Align the BURST to regular potion on the vector using the signal generator SG2's SC PHASE knob.
4. Align the BURST's beam spot(s) to the circle scale on the vector using the gain control (knob) on the vector.
5. For DNW-75 only: Align the BURST to the specified positions as the dotted lines of right figure using the vector's PHASE knob.

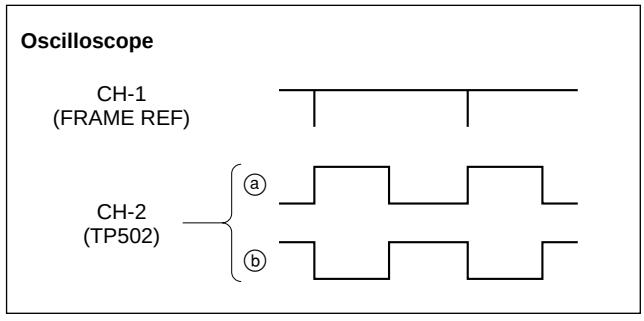


DNW-75 (625/50 System) DNW-75P (525/60 System)

Reference Color Frame Pulse Check

1. To enter the maintenace mode, press S1101(L-1) on the SS-83 board.
2. Enter A20: VPR VR.
3. Connect and set the oscilloscope as follows:
   ALT display mode
   CH-2: TP502/VPR-47(D-1), DC 2 V/DIV
   GND: E501/VPR-47(D-1)
   TIME: 20 ms/DIV for DNW-75
   10 ms/DIV for DNW-75P
   TRIG: CH-1: DC 2 V/DIV
   (Connected SG2's FRAME REF output)
4. Turn the signal generator SG2's SC PHASE control knob clockwise (↻) slowly until the waveform of the oscilloscope's CH-2 (TP502) changes from ⓐ to ⓑ.
5. Measure the BURST phase (angle A) on the vector when just inverted the phase of CH-2 (TP502) on the oscilloscope.
6. To return the position of the BURST signal to be displayed on the vector, turn SG2's SC PHASE control knob counterclockwise (↺).
7. Turn the signal generator SG2's SC PHASE control knob counterclockwise (↺) slowly until the waveform of the oscilloscope's CH-2 (TP502) changes from ⓐ to ⓑ.
8. Measure the BURST phase (angle B) on the vector when just inverted the phase of CH-2 (TP502) on the oscilloscope.
9. To return the position of the BURST signal to be displayed on the vector, turn SG2's SC PHASE control knob clockwise (↻).
10. Confirm that the difference between the angles A and B is within specification.
    If the specification is not satisfied, perform steps (1) through (4).
    Specification: A − B = 0 ±10°
11. To exit the A20 : VPR VR, press the MENU button once.


A
A
Turn SC PHASE control knob (SG2) clockwise slowly until the signal phase of CH-2 (TP502) on oscilloscope is inverted. (ⓐ→ⓑ)
Turn SC PHASE control knob (SG2) counterclockwise slowly until the signal phase of CH-2 (TP502) on oscilloscope is inverted. (ⓐ→ⓑ)
B
B
DNW-75 (625/50 System)
DNW-75P (525/60 System)



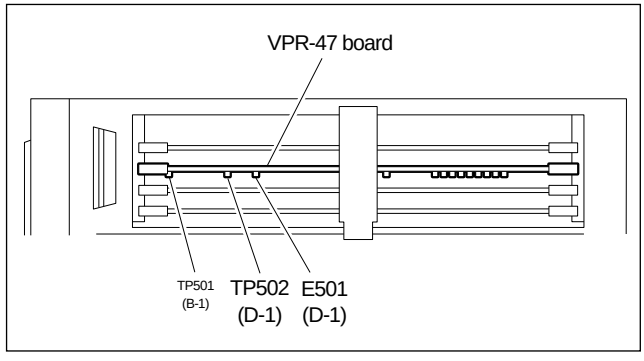
Perform following steps (1) and (2) when the specification in step 10 was not satisfied.

(1) Add/subtract 1 to/from the data value of "REF 1ST FLD DET".

Note

The data increase/decrease is dependent on the angles A and B measured in steps 5 and 8.
A > B : Subtract 1 from the data value.
A < B : Add 1 to the data value.

(2) Return to step 4.



Data save (Store the adjusted data)

Perform following steps 12 and 13 when the data of "REF 1ST FLD DET" in A20 : VPR VR was changed.

12. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
    - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

    Note

    When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
13. To exit A2F : NV-RAM CONTROL, press the MENU button once.

4-7-13. Internal 4fsc Frequency Adjustment (Another System)

Note

For the internal 4fsc frequency adjustment in standard system, refer to Section 4-7-7.

Preparing tools

- Frequency counter:
  ADVANTEST TR5821AK or equivalent
- Analog composite video monitor
  (NTSC/PAL switchable type)

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check the setting on the sub control panel.

CHARACTER switch ⇨ ON

2. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and frequency counter through the power for 30 minutes or more.button three times.

Frequency Adjustment

1. Supply no signal to REF. VIDEO connector. (or non connection)
2. Connect the frequency counter to TP501(B-1) on the VPR-47 board. GND: E501/VPR-47(D-1)
3. Enter A20 : VPR VR of the maintenance mode.
4. Adjust the frequency on the frequency counter.
   Adj. point: A20 : VPR VR : INT 4FSC FREQ
   Specification: 17,734,476 ±50 Hz for DNW-75
   14,318,181 ±50 Hz for DNW-75P
5. To exit A20 : VPR VR, press the MENU button once.

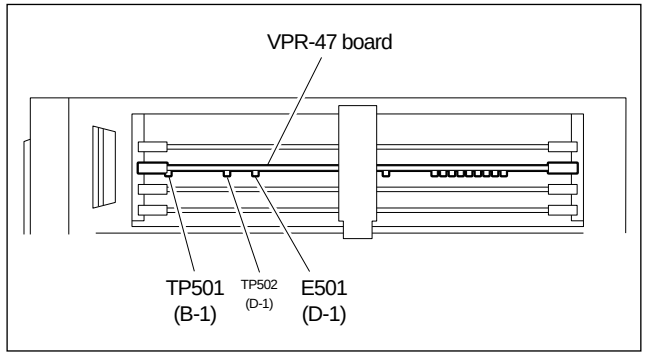
Data save (store the adjusted data)

6. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
7. To exit A2F : NV-RAM CONTROL, press the MENU button once.

8. To exit the maintenance mode, press the MENU button three times.



4-7-14. Perfection in Video System Alignment

1. For the DNW-75P only
   Return the following SUB-ITEM settings of the ITEM-709 and -723 in the setup extend menu to the customer settings. (Refer to step 3 in Section 4-7-8.)
   - 709 : CAV LEVEL FORMAT
     1. OUTPUT CAV LEVEL
   - 713 : VIDEO SETUP REFERENCE LEVEL
     0. MASTER LEVEL
     4. OUTPUT LEVEL
2. Return the video system to the customer setting using the setup menu ITEM-013 : 525/625 SYSTEM SELECT.
   (Refer to Section 7-2-2 of the operation manual.)
3. Return the switch settings to the customer setting.
   (Refer to step 3 in Section 4-7-2.)

4-8. Video Input Line Alignment (DEC-110 Board)

4-8-1. Adjustment Overview

Section 4-8 explains the alignment of the following video input lines.
- Analog composite video input
- Analog component video input

For the adjustments, perform the adjustments using the menu of the maintenance mode.
When the DEC-110 board was replaced or repaired, perform the video system alignment.

Notes

- In the DNW-75, be sure to adjust in 525/60 system before 625/50 system.
  In the DNW-75P, be sure to adjust in 625/50 system before 525/60 system.
- In the video input line alignment, be sure to adjust without the extension board.
- For the video system except video input lines, refer to Section 4-7.

Note

For detail of each menu in the maintenance mode, refer to Section 3.

In Section 4-8, expresses the 525/60 and 625/50 systems as follows:

Video system	DNW-75	DNW-75P
525/60	Standard system	Another system
625/50	Another system	Standard system

Tools List

To perform the video input line alignment for the VTR, prepare the following equipment and fixtures.

- Analog composite video signal generators
  - For 525/60 system: TEKTRONIX TSG-170A or equivalent
  - For 625/50 system: TEKTRONIX TSG-271 or equivalent
- Analog composite waveform/vector monitors
  - For 525/60 system: TEKTRONIX 1750, 1780R, or equivalent
  - For 625/50 system: TEKTRONIX 1751, 1781R, or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog component waveform monitor: TEKTRONIX WFM300 or equivalent
- Serial component waveform monitor: TEKTRONIX WFM601 or equivalent

  Note

  When this waveform monitor is not available, use the above analog component waveform monitor instead.
- Analog composite video monitor (NTSC/PAL switchable type)

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- 75 Ω terminators (3 pieces)

Adjustment Items

Section	Item	Adjustment point	Remarks
4-8-2	Preparation in standard system		DNW-75: 525/60 system DNW-75P: 625/50 system
4-8-3	Composite video output line check		VIDEO OUTPUT COMPOSITE 1
4-8-4	Composite video input line adjustment		
	Pedestal level	A25 : DEC VR : PEDESTAL	VIDEO OUTPUT COMPOSITE 2
	Gain (MANUAL)	A25 : DEC VR : VIDEO GAIN	
	Gain (AGC)	A25 : DEC VR : AGC VIDEO GAIN	
	Color frame detect	A24 : INPUT CF DETECT	(Automatic adjustment)
	Data save	A2F : NV-RAM CONTROL	
4-8-5	Component video output line check		VIDEO OUTPUT COMPONENT
4-8-6	Component video input line adjustment		
	Input level	A22 : AD VR(LOOP): Y INPUT LEVEL A22 : AD VR(LOOP): R-Y INPUT LEVEL A22 : AD VR(LOOP): B-Y INPUT LEVEL	SDI OUTPUT 1 or VIDEO OUTPUT COMPONENT
	Input phase	A22 : AD VR(LOOP): Y INPUT PHASE A22 : AD VR(LOOP): Y/B-Y INPUT DELAY A22 : AD VR(LOOP): Y/R-Y INPUT DELAY	
	Betacam Input level	A22 : AD VR(LOOP): B-CAM Y IN LEVEL A22 : AD VR(LOOP): B-CAM R-Y IN LEVEL A22 : AD VR(LOOP): B-CAM B-Y IN LEVEL	
	Data save	A2F : NV-RAM CONTROL	
4-8-7	Preparation in another system		DNW-75: 625/50 system DNW-75P: 525/60 system
4-8-8	Composite video output line check		VIDEO OUTPUT COMPOSITE 1
4-8-9	Composite video input line adjustment		
	Pedestal level	A25 : DEC VR : PEDESTAL	VIDEO OUTPUT COMPOSITE 2
	Gain (MANUAL)	A25 : DEC VR : VIDEO GAIN	
	Gain (AGC)	A25 : DEC VR : AGC VIDEO GAIN	
	Color frame detect	A24 : INPUT CF DETECT	(Automatic adjustment)
	Data save	A2F : NV-RAM CONTROL	
4-8-10	Component video output line check		VIDEO OUTPUT COMPONENT
4-8-11	Component video input line adjustment		
	Input level	A22 : AD VR(LOOP): Y INPUT LEVEL A22 : AD VR(LOOP): R-Y INPUT LEVEL A22 : AD VR(LOOP): B-Y INPUT LEVEL	SDI OUTPUT 1 or VIDEO OUTPUT COMPONENT
	Input phase	A22 : AD VR(LOOP): Y INPUT PHASE A22 : AD VR(LOOP): Y/B-Y INPUT DELAY A22 : AD VR(LOOP): Y/R-Y INPUT DELAY	
	Betacam Input level	A22 : AD VR(LOOP): B-CAM Y IN LEVEL A22 : AD VR(LOOP): B-CAM R-Y IN LEVEL A22 : AD VR(LOOP): B-CAM B-Y IN LEVEL	
	Data save	A2F : NV-RAM CONTROL	
4-8-12	Perfection in video input line adjustment		

4-8-2. Preparation in Standard System

1. Set the VTR's switches as follows:

Location	Item		Customer setting		Setting at adjustment
SS-83 board	DIP switch S1100-1 (M-1) **Note** Set to ON to treat the extended menu of the setup menu.			⇨	ON (Set to the up position)
Sub control panel	CHARACTER switch			⇨	ON
	PROCESS CONTROL switch			⇨	LOCAL
	• VIDEO switch			⇨	PRESET
	• CHROMA switch			⇨	PRESET
	• SETUP/BLACK LEVEL switch			⇨	PRESET
	• CHROMA PHASE switch			⇨	PRESET
Connector panel	75 Ω switch	REF. VIDEO		⇨	ON (Set to the up position)
		COMPOSITE		⇨	ON (Set to the up position)

2. Set the following mode of the analog composite monitor.
   DNW-75: NTSC
   DNW-75P: PAL
3. Check that the video system is setting as follows:
   DNW-75: 525/60 system
   DNW-75P: 625/50 system
   If differed, change the video system in the setup menu ITEM-013 before adjusting.
   (For the ITEM-013, refer to Section 7-2-2 of the operation manual.)
4. For the DNW-75 only:
   Set the ITEM-709 and -713 in the setup extended menu as follows:

ITEM No.	SUB-ITEM	Customer setting		Setting at adjustment
709 : CAV LEVEL FORMAT	0. INPUT CAV LEVEL		⇨	B-CAM
	1. OUTPUT CAV LEVEL		⇨	B-CAM
713 : VIDEO SETUP REFERENCE LEVEL	0. MASTER LEVEL		⇨	0.0%
	1. INPUT LEVEL		⇨	MSTER
	2. VBLK REMOVE CNT		⇨	REMOV
	4. OUTPUT LEVEL		⇨	MSTER

5. When extending the DEC-110 board with an extension board, stop the extending.
   Note
   If stopping the extension to the DEC-110 board, off the power, then remove the DEC-110 board.
6. Perform the other settings.
   Upper control panel
   VIDEO INPUT SELECT: COMPOSITE
   Lower control panel
   PB. EE button: Light on

4-8-3. Composite Video Output Line Check (Standard System)

Check the output level of VIDEO OUTPUT COMPOSITE 1 connector referring to Section 4-7-3.

4-8-4. Composite Video Input Line Adjustment (Standard System)

Note

For the composite video input line adjustment in the another system, refer to Section 4-8-9.

Preparing tools

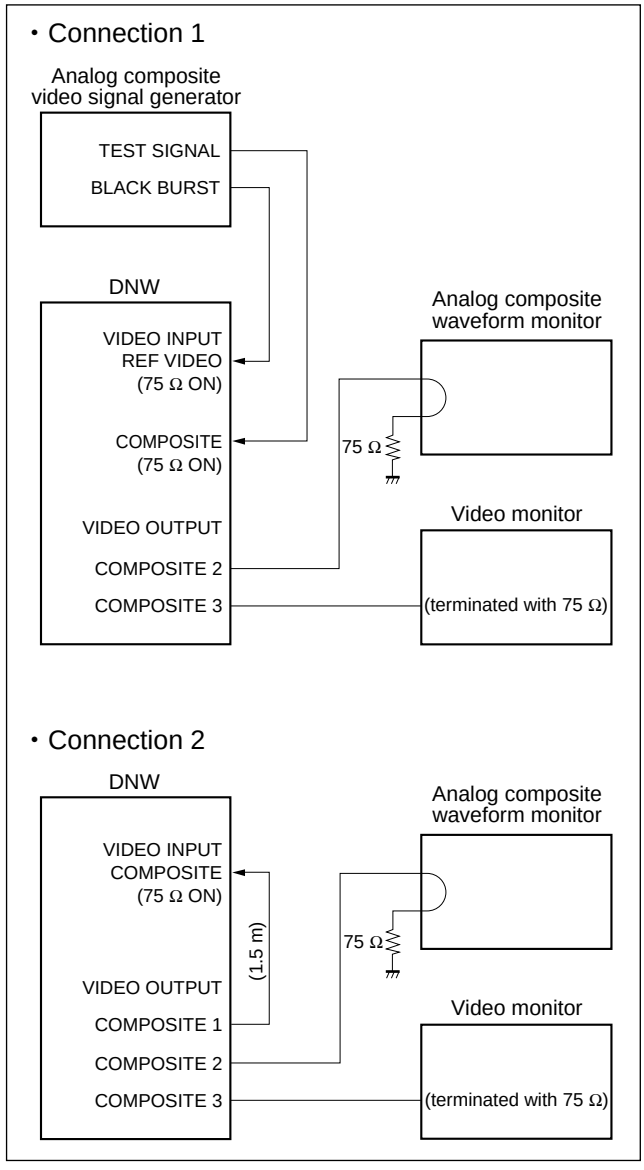
- Analog composite video signal generator
  For DNW-75: TEKTRONIX TSG-190A, or equivalent
  For DNW-75P: TEKTRONIX TSG-271A, or equivalent
- Analog composite waveform monitor
  For DNW-75: TEKTRONIX 1750, 1780R, or equivalent
  For DNW-75P: TEKTRONIX 1751, 1781R, or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor
  Note
  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector otherwise note.
- 75 Ω terminator

Preparation

1. Check the switch setting on the SS-83 board.
S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.
CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SETUP/BLACK LEVEL switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the equipment as shown Connection 1 on Figure “Connections”.



Connections

4. Check the setup extend menu setting. (For the DNW-75 only)

ITEM-713 : VIDEO SETUP REFERENCE LEVEL

0. MASTER LEVEL	⇨ 0.0%
1. INPUT LEVEL	⇨ MSTER
2. V BLK REMOTE CNT	⇨ REMOV
4. OUTPUT LEVEL	⇨ MSTER

5. Check the other settings.

Upper control panel

VIDEO INPUT SELECT: COMPOSITE

Lower control panel

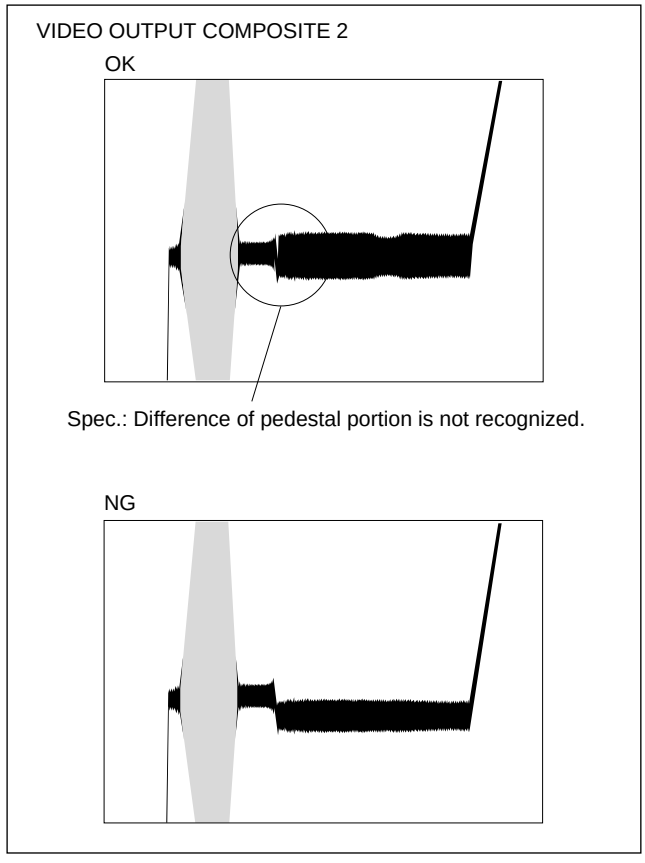
PB. EE button: Light on

6. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 30 minutes or more.

1. Pedestal level Adjustment

1. To enter the maintenace mode, press S1101(L-1) on the SS-83 board.
2. Enter A2: AUDIO/VIDEO ADJUST.
3. Enter A25: DEC VR.
4. Input the lamp signal from the signal generator.
5. Watch the burst signal portion of VIDEO OUTPUT COMPOSITE 2 output with the waveform monitor.
   - Setting of waveform monitor
     SWEEP: 1 H, MAG
     GAIN: ×5
     UNCAL: MAX
6. Adjust the pedestal level.
   Adj. point: A25: DECVR: PEDESTAL
   Specification: See the figure below.



7. To exit A2: AUDIO/VIDEO ADJUST, press the MENU buton two times.

2. Gain Adjustment (MANUAL/AGC)

1. Connect as connection 2 on page 2-60.
2. Enter C2: AUDIO/VIDEO CHECK.
3. In C22: MULTI LOOP (10 TIMES) of the maintenance mode, select “100 % Color Bars” as test signal.
4. To exit C2: AUDIO/VIDEO CHECK.
5. Enter A2: AUDIO/VIDEO ADJUST.
6. Enter A25: DEC VR.

MANUAL

7. Select “VIDEO GAIN”.
8. Adjust so that the specification is satisfied.
   Adj. point: A25: DEC VR: VIDEO GAIN
   Specification: See the figure 1.

AGC

9. Select “AGC VIDEO GAIN”.
10. Adjust so that the specification is satisfied.
    Adj. point: A25: DEC VR: AGC VIDEO GAIN
    Specification: See the figure 1.
11. To exit A25: DEC VR, press the MENU button once.

3. Pedestal Level Check

1. Return the connection as connection 1 on page 2-60.
2. Input the lamp signal from the signal generator.
3. Watch the burst signal portion of VIDEO OUTPUT COMPOSITE 2 output with the waveform monitor.
   • Setting of waveform monitor
   SWEEP: 1 H, MAG
   GAIN: ×5
   UNCAL: MAX
4. Check that the pedestal portion satisfies the specification.
   If not, perform “1. Pedestal Level Adjustment” again.
   Specification: See the figure 2.

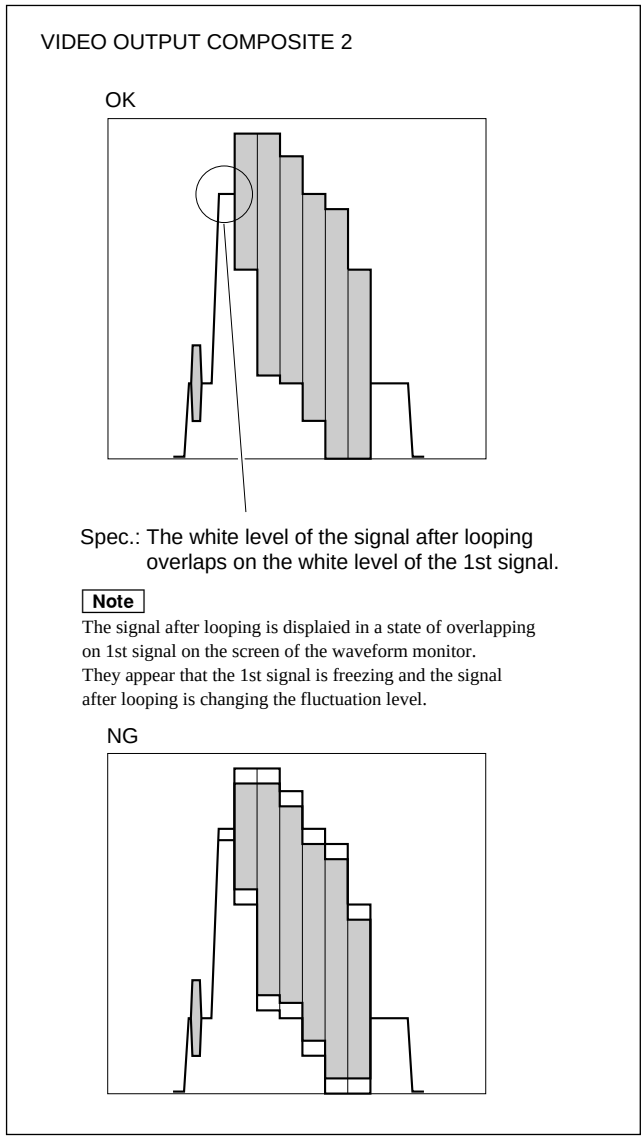

VIDEO OUTPUT COMPOSITE 2
OK
Spec.: The white level of the signal after looping overlaps on the white level of the 1st signal.
Note
The signal after looping is displaied in a state of overlapping on 1st signal on the screen of the waveform monitor.
They appear that the 1st signal is freezing and the signal after looping is changing the fluctuation level.
NG

Figure 1. Gain Adjustment

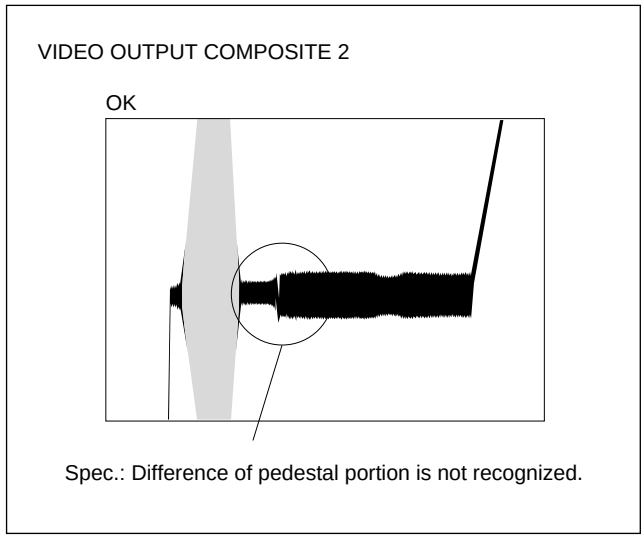


Figure 2. Pedestal Level Check

http://getMANUAL.com

4. Color Frame Detection Adjustment

Note

Check that the video output SCH from the signal generator is within 0 ±5°.

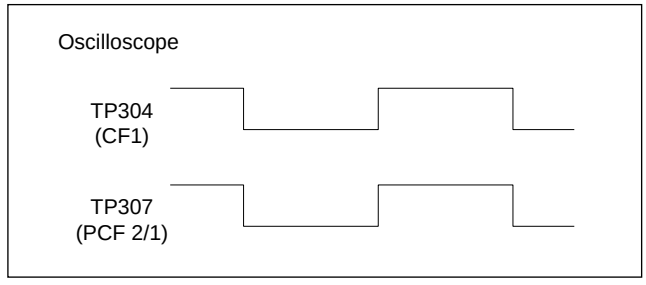
1. Input the lamp signal from the signal generator.
2. Enter A24 : INPUT CF DETECT.

   Note

   In this time, the adjustment mode is the manual, and "Manual" is displayed on the video monitor.
   (In the time data display area of the VTR, "MANUAL" is displayed.)
3. Change the adjustment mode to the automatic.
   (Change the massage to "Auto (Push SET button)".)

   Note

   How to change the adjustment mode from the manual to the automatic:
   When there is the ⁎-mark to ahead of "Manual", turn the search dial in FORWARD (↻) direction while pressing the JOG button.
   (In the time data display area, "PUSH SET" is displayed.)
4. To execute the automatic adjustment, press the SET button once on the lower control panel.
   - The displayed message on the video monitor changes to "Auto Adjusting ...". The displayed data value also changes.
     The display in the time data display area does not change. ("PUSH SET" in it remain displayed.)
5. Confirm the automatic adjustment completion on the video monitor.
   - Message "Auto Adjust Complete" is displayed when the automatic adjustment is completed.
6. Connect and set the oscilloscope as follows:
   CH-1: TP304/VPR-47(L-1) , DC 500 mV/DIV
   GND: E100/VPR-47(J-1)
   CH-2: TP307/VPR-47(M-1) , DC 500 mV/DIV
   GND: E100/VPR-47(J-1)
   TIME: 10 ms/DIV
7. Check that two waveforms (TP304 and TP307) are the same phase.



8. To exit the menu of A24 : INPUT CF DETECT, press the MENU button once.

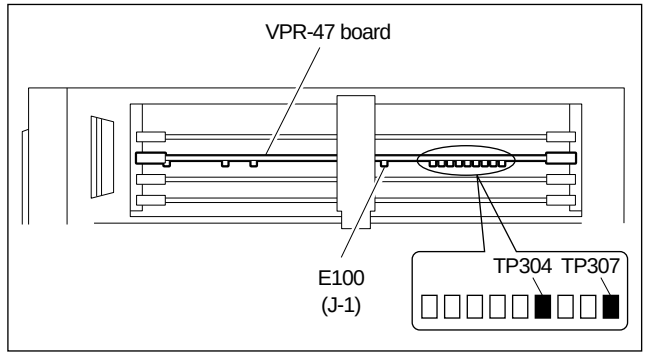
5. Data Save (Store the adjusted data)

1. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".

2. To exit the maintenance mode, press the MENU button four times.



4-8-5. Component Video Output Line Check (Standard System)

Check the output levels and output phase of VIDEO OUTPUT COMPONENT output referring to Sections 4-7-4 and 4-7-5.

4-8-6. Component Video Input Line Adjustment (Standard System)

Note

For the component video input line adjustment in the another system, refer to Section 4-8-11.

Preparing tools

- Component waveform monitor:
  TEKTRONIX WFM300, WFM601, or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector otherwise note.
- 75 Ω terminator

Preparation

1. Check the switch setting on the SS-83 board.

S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SETUP/BLACK LEVEL switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the equipment referring to Figure "Connections".

4. Check the setup extend menu setting. (For the DNW-75 only)

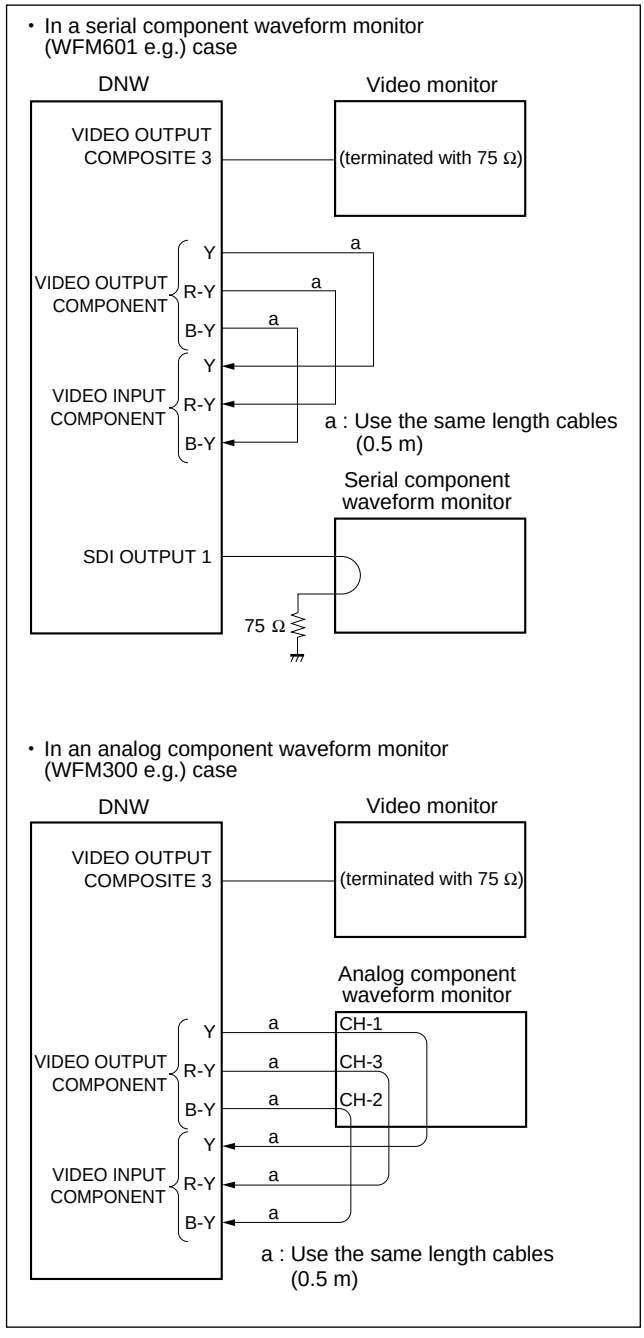
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
1. INPUT LEVEL ⇨ MSTER
2. V BLK REMOTE CNT ⇨ REMOV
4. OUTPUT LEVEL ⇨ MSTER

5. Check the other settings.

Upper control panel
VIDEO INPUT SELECT: COMPOSITE
Lower control panel
PB. EE button: Light on

6. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and component waveform monitor through the power for 30 minutes or more.



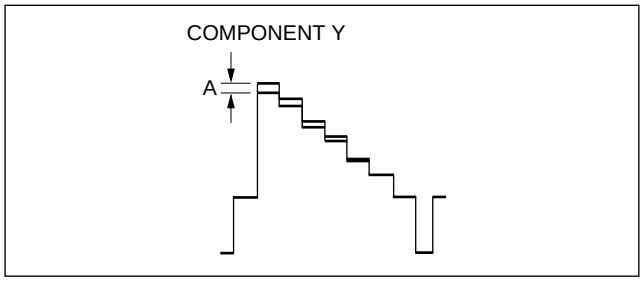
Connections

1. Input Level Adjustment

1. To enter the maintenace mode, press S1101(L-1) on the SS-83 board.
2. Enter A2: AUDIO/VIDEO ADJUST.
3. Enter A22: AD VR (LOOP).

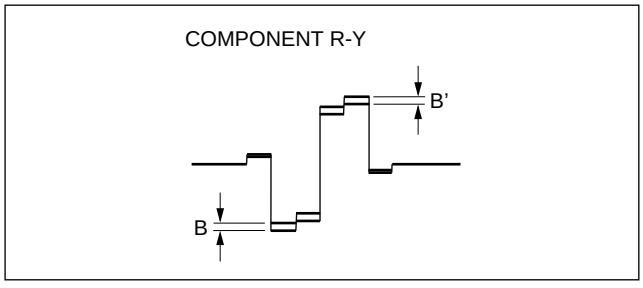
Y adjustment

4. Select “Y INPUT LEVEL”.
5. Watch the Y signal with the component waveform monitor, then adjust the level A.
   Adj. point: A22: AD VR (LOOP) : Y INPUT LEVEL
   Specification: A is minimize.



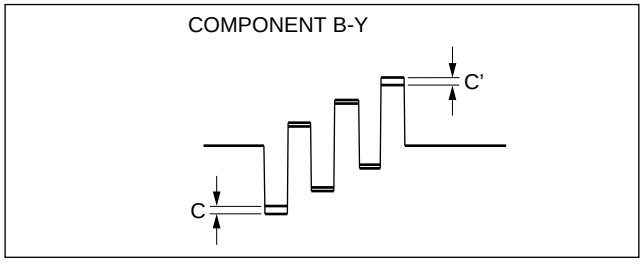
R-Y adjustment

6. Select “R-Y INPUT LEVEL”.
7. Watch the R-Y signal with the component waveform monitor, then adjust the looped signal level.
   Adj. point: A22: AD VR (LOOP) : R-Y INPUT LEVEL
   Specification: B = B’



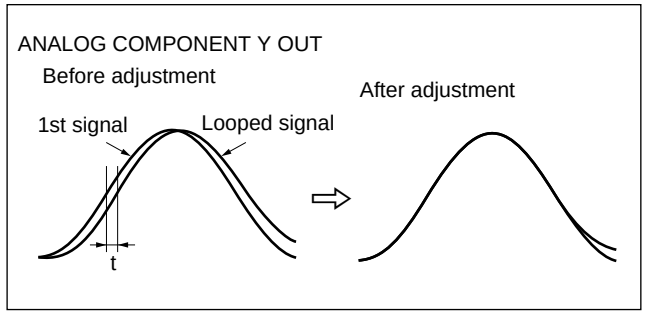
B-Y adjustment

8. Select “B-Y INPUT LEVEL”.
9. Watch the B-Y signal with the component waveform monitor, then adjust the looped signal level.
   Adj. point: A22: AD VR (LOOP) : B-Y INPUT LEVEL
   Specification: C = C’

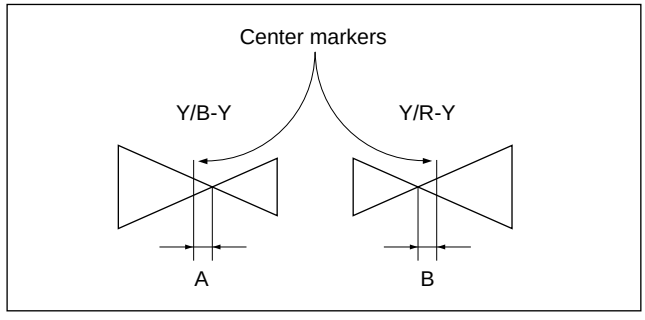


2. Input Phase Adjustment

1. Select “Y INPUT PHASE”.
2. Watch the Y signal with the component waveform monitor.
3. Display 2T pulse portion by magnifying the horizontal axis of the component waveform monitor.
4. Adjust so that 1st signal and looped signal overlap.
   Adj. point: A22: AD VR (LOOP) : Y INPUT PHASE
   Specification: t ≦ 20 ns



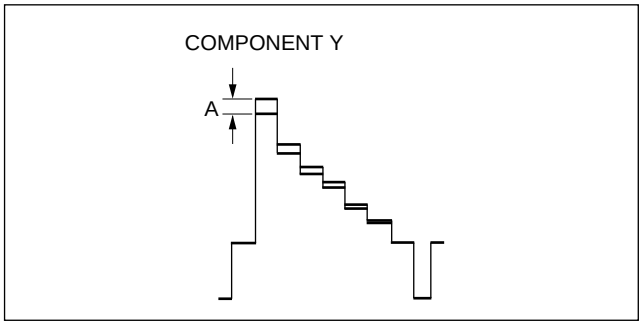
5. Set the component waveform monitor to BOWTIE mode.
6. Select “Y/B-YINPUT DELAY”
7. Adjust the cross point of Y/B-Y.
   Adj. point: A22: AD VR (LOOP) : Y/B-Y INPUT DELAY
   Specification: A = 0 ±10 ns
   (Center marker is reference.)
8. Adjust the cross point of Y/R-Y.
   Adj. point: A22: AD VR (LOOP) : Y/R-Y INPUT DELAY
   Specification: B = 0 ±10 ns
   (Center marker is reference.)



3. Betacam Input Level Adjustment

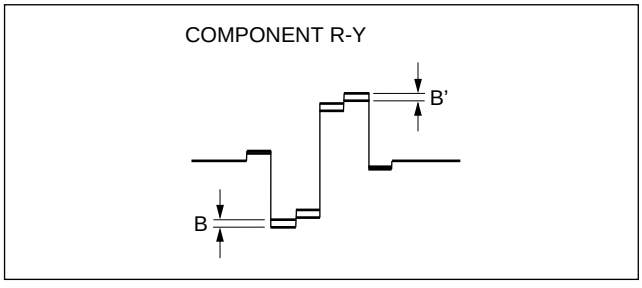
Y adjustment

1. Select “B-CAM IN LEVEL”.
2. Watch the Y signal with the component waveform monitor, then adjust the level A.
   Adj. point: A22: AD VR (LOOP) : B-CAM IN LEVEL
   Specification: A is minimize.



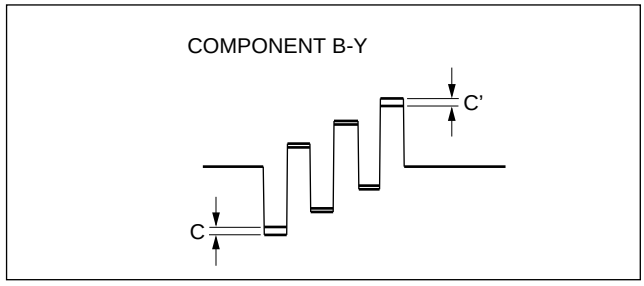
R-Y adjustment

3. Select “B-CAM R-Y IN LEVEL”.
4. Watch the R-Y signal with the component waveform monitor, then adjust the looped signal level.
   Adj. point: A22: AD VR (LOOP) : B-CAM R-Y IN LEVEL
   Specification: B = B’



B-Y adjustment

5. Select “B-CAM B-Y IN LEVEL”.
6. Watch the B-Y signal with the component waveform monitor, then adjust the looped signal level.
   Adj. point: A22: AD VR (LOOP) : B-CAM B-Y IN LEVEL
   Specification: C = C’



7. To exit A22: AD VR (LOOP) , press the MENU button once.

4. Data Save (Store the Adjusted Data)

1. Enter A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   • Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.

2. To exit the maintenance mode, press the MENU button four times.

4-8-7. Preparation in Another System

Notes

- Be sure to perform the adjustments in the another system after completing the adjustments in the standard system.
- The settings of the VTR's switches are the same as the Preparation in standard system.

For the DNW-75

1. Return the following SUB-ITEM settings of the ITEM-709 and -723 in the setup extend menu to the customer settings. (Refer to step 3 in Section 4-8-2.)
   - 709 : CAV LEVEL FORMAT
     1. OUTPUT CAV LEVEL
   - 713 : VIDEO SETUP REFERENCE LEVEL
     0. MASTER LEVEL
     1. INPUT LEVEL
     2. V BLK REMOVE CNT
     4. OUTPUT LEVEL
2. Turn the video system to a 625/50 system using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 of the operation manual.)
3. Set the analog composite monitor to the PAL mode.

For the DNW-75P

1. Turn the video system to a 525/60 system using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 of the operation manual.)
2. Set the analog composite monitor to the NTSC mode.
3. Set the ITEM-709 and -713 in the setup extended menu as follows:

ITEM No. SUB-ITEM	Customer setting		Setting at adjustment
709 : CAV LEVEL FORMAT			
1. OUTPUT CAV LEVEL	_____	⇨	B-CAM
713 : VIDEO SETUP REFERENCE LEVEL			
0. MASTER LEVEL	_____	⇨	0.0%
1. INPUT LEVEL	_____	⇨	MSTER
2. V BLK REMOVE CNT	_____	⇨	REMOV
4. OUTPUT LEVEL	_____	⇨	MSTER

4-8-8. Composite Video Output Line Check (Another System)

Check the output level of VIDEO OUTPUT COMPOSITE 1 connector referring to Section 4-7-9.

4-8-9. Composite Video Input Line Adjustment (Another System)

Note

For the composite video input line adjustment in the standard system, refer to Section 4-8-3.

Preparing tools

- Analog composite video signal generator
  For DNW-75: TEKTRONIX TSG-271A, or equivalent
  For DNW-75P: TEKTRONIX TSG-190A, or equivalent
- Analog composite waveform monitor
  For DNW-75: TEKTRONIX 1751, 1781R, or equivalent
  For DNW-75P: TEKTRONIX 1750, 1780R, or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor
  Note
  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector otherwise note.
- 75 Ω terminator

Preparation

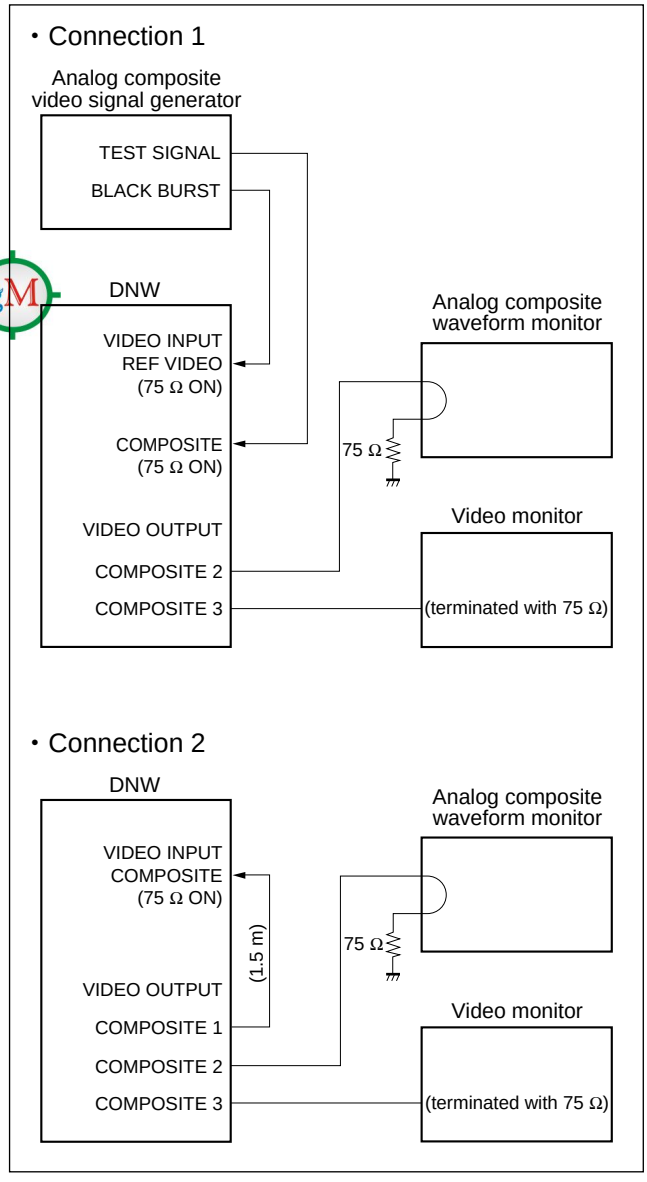
1. Check the switch setting on the SS-83 board.

S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SETUP/BLACK LEVEL switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the equipment as shown Connection 1 on Figure “Connections”.



Connections

4. Check the setup extend menu setting. (For the DNW-75P only)

ITEM-713 : VIDEO SETUP REFERENCE LEVEL

0. MASTER LEVEL	⇨ 0.0%
1. INPUT LEVEL	⇨ MSTER
2. V BLK REMOTE CNT	⇨ REMOV
4. OUTPUT LEVEL	⇨ MSTER

5. Check the other settings.

Upper control panel

VIDEO INPUT SELECT: COMPOSITE

Lower control panel

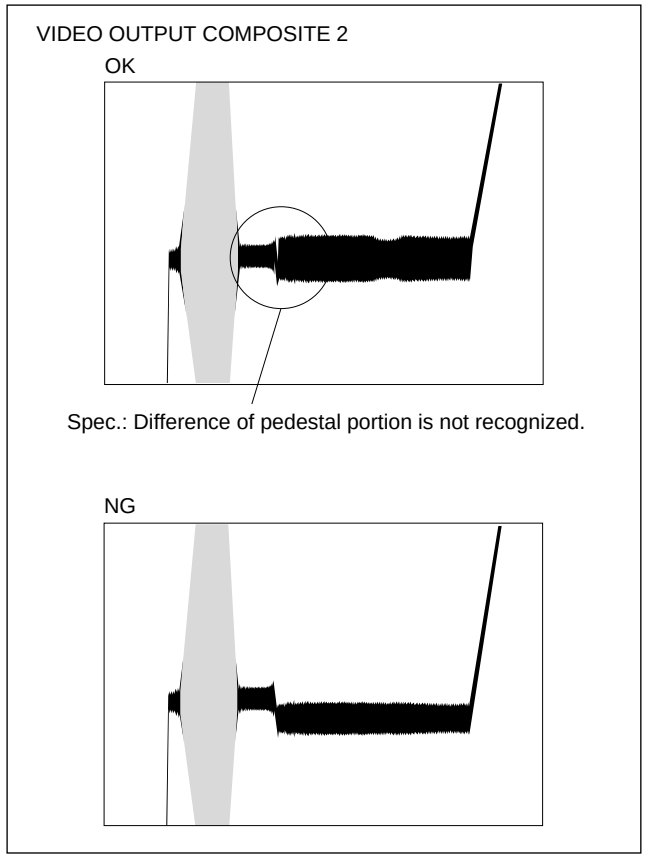
PB. EE button: Light on

6. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and composite waveform monitor through the power for 30 minutes or more.

1. Pedestal level Adjustment

1. To enter the maintenace mode, press S1101(L-1) on the SS-83 board.
2. Enter A2: AUDIO/VIDEO ADJUST.
3. Enter A25: DEC VR.
4. Input the lamp signal from the signal generator.
5. Watch the burst signal portion of VIDEO OUTPUT COMPOSITE 2 output with the waveform monitor.
   - Setting of waveform monitor
     SWEEP: 1 H, MAG
     GAIN: ×5
     UNCAL: MAX
6. Adjust the pedestal level.
   Adj. point: A25: DECVR: PEDESTAL
   Specification: See the figure below.



7. To exit A2: AUDIO/VIDEO ADJUST, press the MENU buton two times.

2. Gain Adjustment (MANUAL/AGC)

1. Connect as connection 2 on page 4-54.
2. Enter C2: AUDIO/VIDEO CHECK.
3. In C22: MULTI LOOP (10 TIMES) of the maintenance mode, select “100 % Color Bars” as test signal.
4. To exit C2: AUDIO/VIDEO CHECK.
5. Enter A2: AUDIO/VIDEO ADJUST.
6. Enter A25: DEC VR.

MANUAL

7. Select “VIDEO GAIN”.
8. Adjust so that the specification is satisfied.
   Adj. point: A25: DEC VR: VIDEO GAIN
   Specification: See the figure 1.

AGC

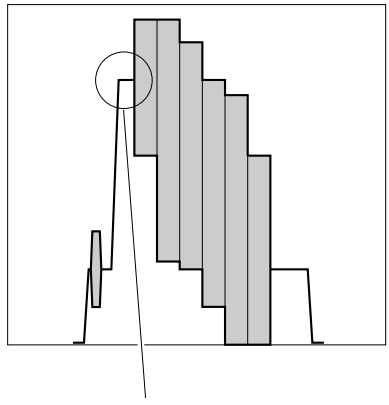
9. Select “AGC VIDEO GAIN”.
10. Adjust so that the specification is satisfied.
    Adj. point: A25: DEC VR: AGC VIDEO GAIN
    Specification: See the figure 1.
11. To exit A25: DEC VR, press the MENU button once.

3. Pedestal Level Check

1. Return the connection as connection 1 on page 4-54.
2. Input the lamp signal from the signal generator.
3. Watch the burst signal portion of VIDEO OUTPUT COMPOSITE 2 output with the waveform monitor.
   - Setting of waveform monitor
     SWEEP: 1 H, MAG
     GAIN: ×5
     UNCAL: MAX
4. Check that the pedestal portion satisfies the specification.
   If not, perform “1. Pedestal Level Adjustment” again.
   Specification: See the figure 2.

VIDEO OUTPUT COMPOSITE 2

OK



Spec.: The white level of the signal after looping overlaps on the white level of the 1st signal.

Note

The signal after looping is displaied in a state of overlapping on 1st signal on the screen of the waveform monitor.
They appear that the 1st signal is freezing and the signal after looping is changing the fluctuation level.

NG

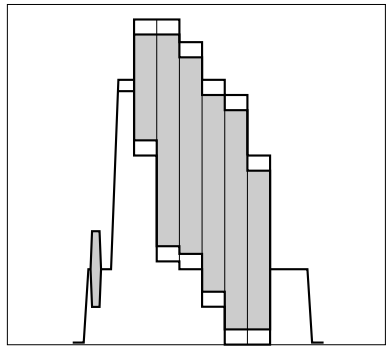
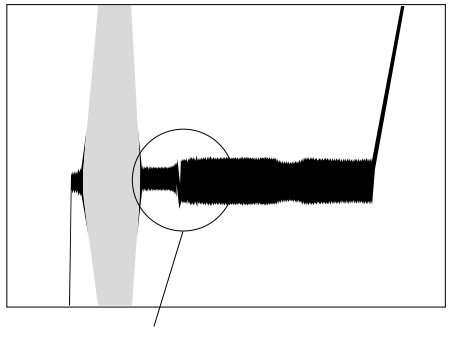


Figure 1. Gain Adjustment

VIDEO OUTPUT COMPOSITE 2

OK



Spec.: Difference of pedestal portion is not recognized.

Figure 2. Pedestal Level Check

4. Color Frame Detection Adjustment

Note

Check that the video output SCH from the signal generator is within 0 ±5°.

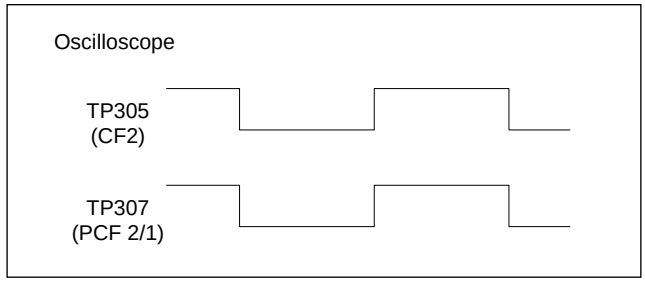
1. Input the lamp signal from the signal generator.
2. Enter A24 : INPUT CF DETECT.

   Note

   In this time, the adjustment mode is the manual, and "Manual" is displayed on the video monitor.
   (In the time data display area of the VTR, "MANUAL" is displayed.)
3. Change the adjustment mode to the automatic.
   (Change the massage to "Auto (Push SET button)".)

   Note

   How to change the adjustment mode from the manual to the automatic:
   When there is the ∗-mark to ahead of "Manual", turn the search dial in FORWARD (↻) direction while pressing the JOG button.
   (In the time data display area, "PUSH SET" is displayed.)
4. To execute the automatic adjustment, press the SET button once on the lower control panel.
   - The displayed message on the video monitor changes to "Auto Adjusting ...". The displayed data value also changes.
     The display in the time data display area does not change. ("PUSH SET" in it remain displayed.)
5. Confirm the automatic adjustment completion on the video monitor.
   - Message "Auto Adjust Complete" is displayed when the automatic adjustment is completed.
6. Connect and set the oscilloscope as follows:
   CH-1: TP305/VPR-47(L-1) , DC 500 mV/DIV
   GND: E100/VPR-47(J-1)
   CH-2: TP307/VPR-47(M-1) , DC 500 mV/DIV
   GND: E100/VPR-47(J-1)
   TIME: 20 ms/DIV
7. Check that two waveforms (TP304 and TP307) are the same phase.



8. To exit the menu of A24 : INPUT CF DETECT, press the MENU button once.

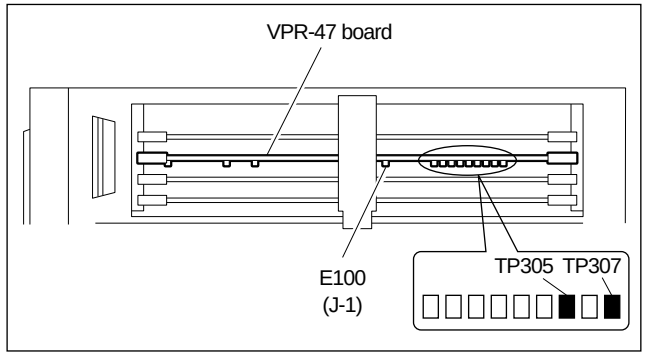
5. Data Save (Store the Adjusted Data)

1. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".

2. To exit the maintenance mode, press the MENU button four times.



4-8-10. Component Video Output Line Check (Another System)

Check the output levels of VIDEO OUTPUT COMPONENT output referring to Section 4-7-10.

4-8-11. Component Video Input Line Adjustment (Another System)

Note

For the component video input line adjustment in the standard system, refer to Section 4-8-6.

Preparing tools

- Component waveform monitor:
  TEKTRONIX WFM300, WFM601, or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector otherwise note.
- 75 Ω terminator

Preparation

1. Check the switch setting on the SS-83 board.

S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SETUP/BLACK LEVEL switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the equipment referring to Figure "Connections".

4. Check the setup extend menu setting. (For the DNW-75P only)

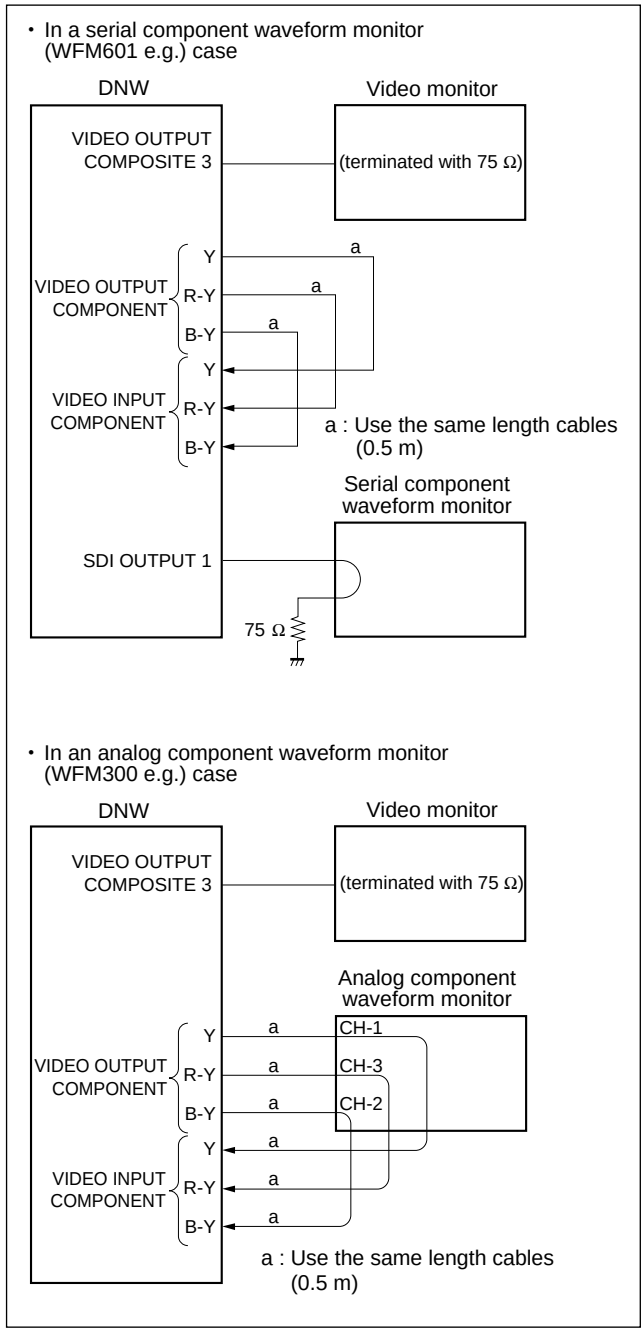
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
1. INPUT LEVEL ⇨ MSTER
2. V BLK REMOTE CNT ⇨ REMOV
4. OUTPUT LEVEL ⇨ MSTER

5. Check the other settings.

Upper control panel
VIDEO INPUT SELECT: COMPOSITE
Lower control panel
PB. EE button: Light on

6. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and component waveform monitor through the power for 30 minutes or more.



Connections

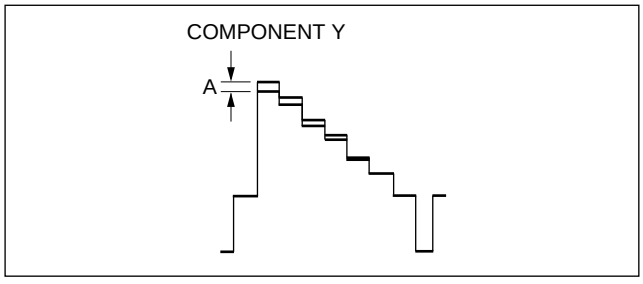
http://getMANUAL.com

1. Input Level Adjustment

1. To enter the maintenace mode, press S1101(L-1) on the SS-83 board.
2. Enter A2 : AUDIO/VIDEO ADJUST.
3. Enter A22 : AD VR (LOOP).

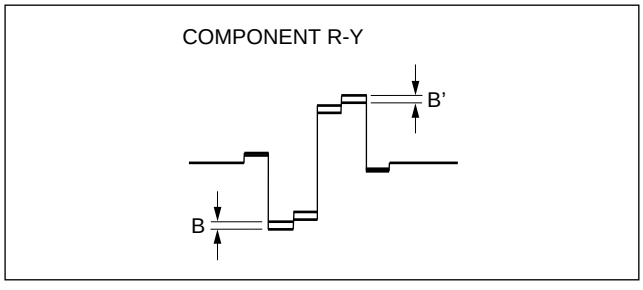
Y adjustment

4. Select “Y INPUT LEVEL”.
5. Watch the Y signal with the component waveform monitor, then adjust the level A.
   Adj. point: A22 : AD VR (LOOP) : Y INPUT LEVEL
   Specification: A is minimize.



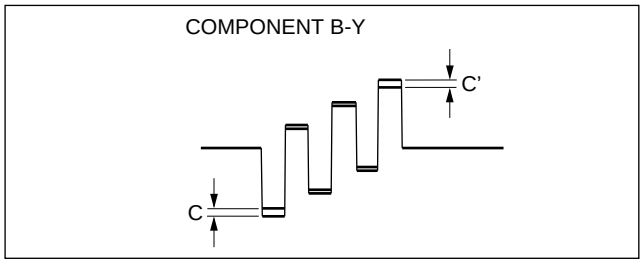
R-Y adjustment

6. Select “R-Y INPUT LEVEL”.
7. Watch the R-Y signal with the component waveform monitor, then adjust the looped signal level.
   Adj. point: A22 : AD VR (LOOP) : R-Y INPUT LEVEL
   Specification: B = B’



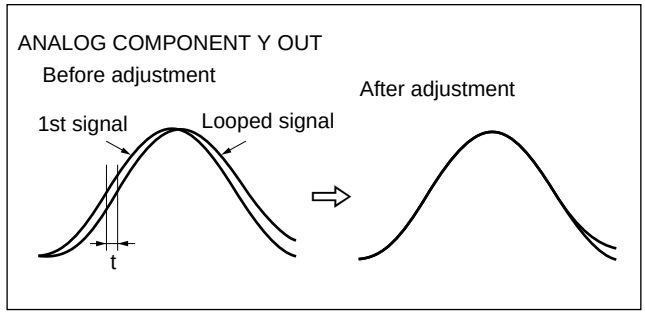
B-Y adjustment

8. Select “B-Y INPUT LEVEL”.
9. Watch the B-Y signal with the component waveform monitor, then adjust the looped signal level.
   Adj. point: A22 : AD VR (LOOP) : B-Y INPUT LEVEL
   Specification: C = C’

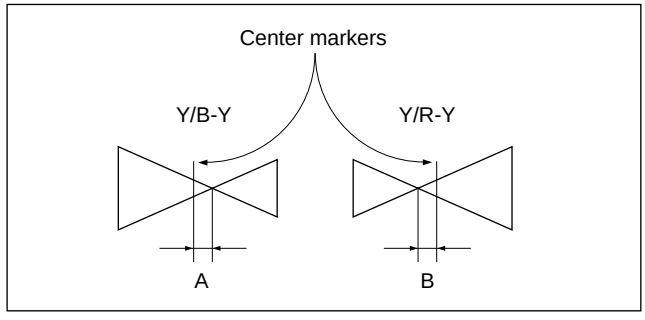


2. Input Phase Adjustment

1. Select “Y INPUT PHASE”.
2. Watch the Y signal with the component waveform monitor.
3. Display 2T pulse portion by magnifying the horizontal axis of the component waveform monitor.
4. Adjust so that 1st signal and looped signal overlap.
   Adj. point: A22 : AD VR (LOOP) : Y INPUT PHASE
   Specification: t ≦ 20 ns



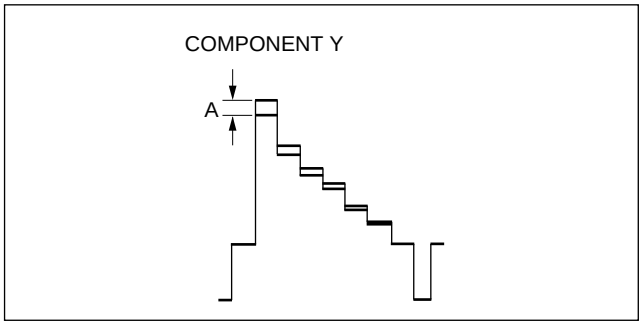
5. Set the component waveform monitor to BOWTIE mode.
6. Select “Y/B-YINPUT DELAY”
7. Adjust the cross point of Y/B-Y.
   Adj. point: A22 : AD VR (LOOP) : Y/B-Y INPUT DELAY
   Specification: A = 0 ±10 ns
   (Center marker is reference.)
8. Adjust the cross point of Y/R-Y.
   Adj. point: A22 : AD VR (LOOP) : Y/R-Y INPUT DELAY
   Specification: B = 0 ±10 ns
   (Center marker is reference.)



3. Betacam Input Level Adjustment

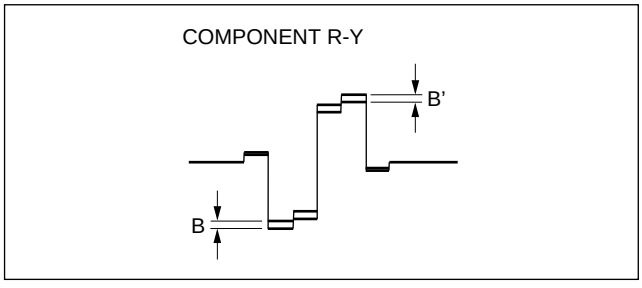
Y adjustment

1. Select “B-CAM IN LEVEL”.
2. Watch the Y signal with the component waveform monitor, then adjust the level A.
   Adj. point: A22 : AD VR (LOOP) : B-CAM IN LEVEL
   Specification: A is minimize.



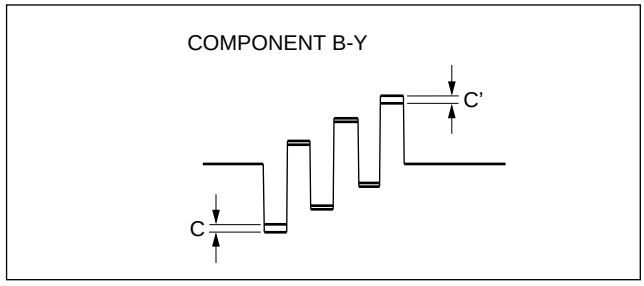
R-Y adjustment

3. Select “B-CAM R-Y IN LEVEL”.
4. Watch the R-Y signal with the component waveform monitor, then adjust the looped signal level.
   Adj. point: A22 : AD VR (LOOP) : B-CAM R-Y IN LEVEL
   Specification: B = B’



B-Y adjustment

5. Select “B-CAM B-Y IN LEVEL”.
6. Watch the B-Y signal with the component waveform monitor, then adjust the looped signal level.
   Adj. point: A22 : AD VR (LOOP) : B-CAM B-Y IN LEVEL
   Specification: C = C’



7. To exit A22 : AD VR (LOOP) , press the MENU button once.

4. Data Save (Store the Adjusted Data)

1. Enter A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   • Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.

2. To exit the maintenance mode, press the MENU button four times.

4-8-12. Perfection in Video System Alignment

1. For the DNW-75P only
   Return the following SUB-ITEM settings of the ITEM-709 and -723 in the setup extend menu to the customer settings. (Refer to step 3 in Section 4-8-7.)
   - 709 : CAV LEVEL FORMAT
     1. OUTPUT CAV LEVEL
   - 713 : VIDEO SETUP REFERENCE LEVEL
     0. MASTER LEVEL
     4. OUTPUT LEVEL
2. Return the video system to the customer setting using the setup menu ITEM-013 : 525/625 SYSTEM SELECT.
   (Refer to Section 7-2-2 of the operation manual.)
3. Return the switch settings to the customer setting.
   (Refer to step 3 in Section 4-8-2.)

4-9. SDI/SDTI I/O Line Adjustment

4-9-1. Adjustment Overview

In the electrical adjustments for the SDI/SDTI input/output, adjust each VCO free-running frequency for the decoders and encoders using the menu in the maintenance mode.
Usually perform the automatic adjustment of Section 4-9-2. If the manually adjustment is needed, refer to Section 4-9-3.

Notes

- For the DNW-75/75P is applied the SDTI input/output function by the following optional kits.
  SDTI input: BKNW-117
  SDTI output: BKNW-118
- For detail of each menu in the maintenance mode, refer to Section 3.

Tools list

To perform the electrical adjustments for the SDI/SDTI input/output lines, prepare the following equipment.

Note

Manually adjustment is not needed when the automatic adjustment can be is performed in the VTR.

When performing the automatic adjustment

- Analog composite video monitor

When performing the manually adjustment

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Frequency counter: ADVANTEST TR5821AK or equivalent
- Extension board: EX-555 (Part No. A-8277-211-A) (for adjusting the SDTI line)
- Analog composite video monitor

Note

This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Adjustment Items

Since above adjustment items can be adjusted independently of each other, no special order has been observed.

Line	Item	Adjustment point	Measurement point for manually adj.
SDI outputs	Encoder1 VCO free-running freq. adj.	A231 : SDI ENC1 VCO	TP201/SDI-41
	Encoder2 VCO free-running freq. adj.	A232 : SDI ENC2 VCO	TP201/SDI-41
SDI input	Decoder VCO free-running freq. adj.	A233 : SDI DEC VCO	TP201/SDI-41
SDTI output	Encoder VCO free-running freq. adj.	A234 : SDTI ENC VCO *1	TP1/DPR-119
SDTI input	Decoder VCO free-running freq. adj.	A234 : SDTI DEC VCO *2	TP100/DPR-120
	Data save	A2F : NV-RAM CONTROL	

∗1: This is displayed when the DPR-119 board is installed.
For the optional kit BKNW-118 (DPR-119 board)
∗2: This is displayed when the DPR-120 board is installed.
For the optional kit BKNW-117 (DPR-120 board)

4-9-2. VCO Free-running Frequency Automatic Adjustment

Preparing tool

- Analog composite video monitor

Note

This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check the setting on the sub control panel.

CHARACTER switch ⇨ ON

2. Check that the VTR has warmed up.

Before starting the adjustment, warm up the VTR through the power for 10 minutes or more.

Automatic Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A23 : CP VR in the maintenance mode.
3. Enter the following specified sub menu.
   SDI output1/2: A231 : SDI ENC1 VR
   SDI output3: A232 : SDI ENC2 VR
   SDI input: A233 : SDI DEC VR
   SDTI output: A234 : SDTI ENC VR (for BKNW-118)
   SDTI input: A235 : SDTI DEC VR (for BKNW-117)

   Note

   In this time, the adjustment mode is the manual, and "Manual" is displayed on the video monitor. (In the time data display area, "MANUAL" is displayed.)
4. Change the adjustment mode to the automatic. (Change the massage to "Auto (Push SET button)".)

   Note

   How to change the adjustment mode from the manual to the automatic:
   When there is the ∗-mark to ahead of "Manual", turn the search dial in FORWARD (↻) direction while pressing the JOG button. (In the time data display area, "PUSH SET" is displayed.)
5. To execute the automatic adjustment, press the SET button once.
   - The displayed message on the video monitor changes to "Auto Adjusting ...". The displayed data value also changes.
     The display in the time data display area does not change. ("PUSH SET" in it remain displayed.)
6. Confirm the automatic adjustment completion on the video monitor.
   - Message "Auto Adjust Complete" is displayed when the automatic adjustment is completed.

   Note

   If message "Auto Adjust Failure" is displayed, refer to the "For Automatic Adjustment Failure" below.
7. To exit the sub menu, press the MENU button once.

   Note

   Go to step 3 in order to perform other VCO free-running frequency adjustment.
8. To exit the menu of A23 : CP VR, press the MENU button once again.

Data save (store the adjusted data)

9. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".

10. To exit the maintenance mode, press the MENU button four times.

For Automatic Adjustment Failure

In the sub menu A231, A232, or A233

Confirm that no abnormality exists in the cable connecting the SDI connectors on the SDI-41 board and rear panel.
If no abnormality is found in the connection, the SDI-41 board is considered to be defective.

In the sub menu A234

Confirm that no abnormality exists in the cable connecting the SDTI output connectors on the DPR-119 board and rear panel.
If no abnormality is found in the connection, the DPR-119 board is considered to be defective.

In the sub menu A235

Confirm that no abnormality exists in the cable connecting the SDTI input connectors on the DPR-120 board and rear panel.
If no abnormality is found in the connection, the DPR-120 board is considered to be defective.

4-9-3. VCO Free-running Frequency Manually Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Frequency counter: ADVANTEST TR5821AK or equivalent
- Extension board: EX-555 (Part No. A-8277-211-A) (for adjusting the SDTI line)
- Analog composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check the setting on the sub control panel.

CHARACTER switch ⇨ ON

2. Extend the DPR-118 board with an extension board EX-555.

Note

Before removing DPR-118 board, turn off the power.

3. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 10 minutes or more.

Manual Adjustment

1. Set the oscilloscope as follows:
   CH-2: DC 2 V/DIV
   TIME: 100 µs/DIV
2. Connect the frequency counter's input to the oscilloscope's CH-2 output.
3. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
4. Enter A23 : CP VR of the maintenance mode.
5. Enter the following specified sub menu.
   SDI output1/2: A231 : SDI ENC1 VR
   SDI output3: A232 : SDI ENC2 VR
   SDI input: A233 : SDI DEC VR
   SDTI output: A234 : SDTI ENC VR (for BKNW-118)
   SDTI input: A235 : SDTI DEC VR (for BKNW-117)

   Note

   In this time, the adjustment mode is the manual, and "Manual" is displayed on the video monitor. (In the time data display area, "MANUAL" is displayed.)
6. Turn the search dial in FORWARD (↻) direction to move the ∗-mark to the line of the adjustment data. (Displays the item title in the time data display area, "SDI ENC1" for example.)
7. Connect the osilloscope's CH-2 input as follows:

For SDI	TP201/SDI-41 (E-1) GND : E6/SDI-41 (B-1)
For SDTI output	TP1/DPR-119 (A-3 of side B) GND : E1/DPR-119 (C-4 of side B)
For SDTI input	TP100/DPR-120 (E-2 of side B) GND : E100/DPR-120 (E-1 of side B)

8. Change the data until the indicated frequency on the frequency counter satisfy the specification.
   Specification: 27.00 ±0.10 MHz

   Note

   How to change the adjustment data:
   Turn the search dial while pressing the JOG button.
9. To exit the sub menu, press the MENU button once.

   Note

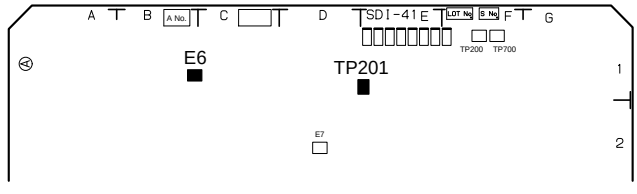
   Go to step 5 in order to perform other VCO free-running frequency adjustment.
10. To exit the menu of A23 : CP VR, press the MENU button once again.

Data save (store the adjusted data)

11. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
    - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

    Note

    When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
12. To exit the maintenance mode, press the MENU button four times.



SDI-41 Board (Side A)

4-10. TBC Remote Control Offset Adjustment (FP-117 Board)

When the CAV control level conversion circuit (about IC7 to IC10) on the FP-117 board was repaired, perform this adjustment.

Note

Before attaching the panel of the upper control panel, perform this adjustment.

Tools

- Digital voltmeter: ADVANTEST TR6845 or equivalent
- Something to short-circuit the D-SUB connector's pins

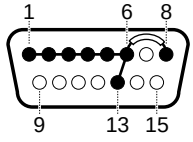
  Note

  There is a convenient with the shorting connector as follows:

  Used component:

  D-SUB connector (female) (Part No. 1-561-610-21)

Short the pins through 6, 8, and 13 of the connector.



Note: Be sure to connect the pin 8 with the covered wire.

Shorting Connector

Preparation

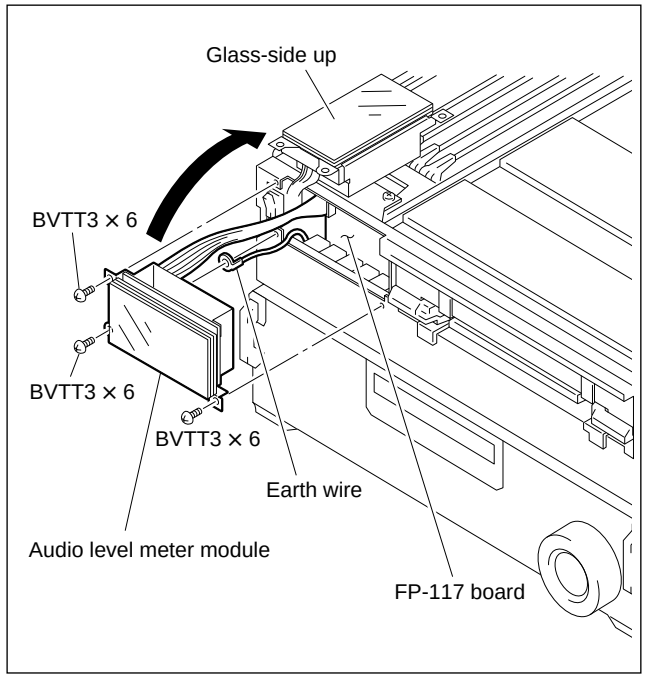
1. If the upper control panel was reattached, remove it. (Refer to Section 1-3-2.)
2. Unscrew the three screws and remove the audio level meter module.

   Note

   There is glass part in the module. Be sure to handle with care.
3. Disconnect the harness from the audio level meter module.

   Note

   Be sure place the audio level meter module on the its glass-side up.



Removing of Audio Level Meter Module

4. Connect the power cord. (POWER switch is OFF.)
5. Turn on the power and warm up the VTR and digital voltmeter through the power for 20 minutes or more.

Adjustment without the Shorting Connector

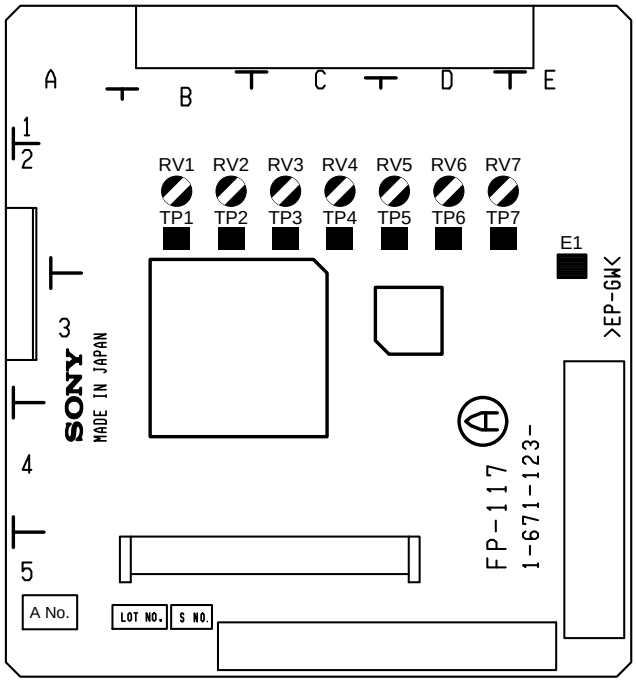
Note

Be sure to short-circuit VIDEO CONTROL connector's pins in the power off.
Never short-circuit this connector's pin 7 (+12 V) or pin 15 (−12 V) to other pin.

1. Turn off the power.
2. Short-circuit VIDEO CONTROL connector's pin 8 (GND) to one of the satisfied pin on the table below.
3. Turn on the power.
4. Connect the digital voltmeter to the specified measurement point on the table below.
5. Adjust the voltage on the digital voltmeter.
   Adj. points: Refer to table below.
   Specification: 2.500 ±0.001 V dc
6. Repeat from step 1 until completing the adjustments for all adjustment points.

Pin No. to short-circuit (Adjusting item)	Measurement point	Adjustment point
1 (SYNC PHASE)	TP6/FP-117(D-2)	⊘RV6/FP-117(D-2)
2 (CHROMA PHASE)	TP5/FP-117(D-2)	⊘RV5/FP-117(D-2)
3 (SC PHASE)	TP7/FP-117(D-2)	⊘RV7/FP-117(D-2)
4 (VIDEO LEVEL)	TP1/FP-117(B-2)	⊘RV1/FP-117(B-2)
5 (SETUP/BLACK LEVEL)	TP3/FP-117(C-2)	⊘RV3/FP-117(C-2)
6 (CHRAMA LEVEL)	TP2/FP-117(B-2)	⊘RV2/FP-117(B-2)
13 (Y/C DELAY*)	TP4/FP-117(C-2)	1RV4/FP-117(D-2)

*: Not use in DNW-75/75P



FP-117 Board (Side A)

Adjustment with the Shorting Connector

Note

Be sure to connect the shorting connector in the power off.

1. Turn off the power.
2. Connect the shorting connector to VIDEO CONTROL connector.
3. Turn on the power.
4. Adjust each voltage on the digital voltmeter.
   Measure. point: Refer to the table below.
   Adj. point: Refer to the table below.
   Specification: 2.500 ±0.001 V dc

Adjusting item	Measurement point	Adjustment point
VIDEO LEVEL	TP1/FP-117(B-2)	⊘RV1/FP-117(B-2)
CHRAMA LEVEL	TP2/FP-117(B-2)	⊘RV2/FP-117(B-2)
SETUP/BLACK LEVEL	TP3/FP-117(C-2)	⊘RV3/FP-117(C-2)
Y/C DELAY*	TP4/FP-117(C-2)	⊘RV4/FP-117(D-2)
CHROMA PHASE	TP5/FP-117(D-2)	⊘RV5/FP-117(D-2)
SYNC PHASE	TP6/FP-117(D-2)	⊘RV6/FP-117(D-2)
SC PHASE	TP7/FP-117(D-2)	⊘RV7/FP-117(D-2)

*: Not use in DNW-75/75P

Perfection

1. Turn off the power.
2. Reinstall the audio level meter module.
   (Perform in the reverse steps 2 and 3 of "Preparation".)
   Notes
   - This module's displaying side is glass. Be sure to handle with care.
   - Fix the earth wire and this module (its left part) together .
3. Reattach the panel for the upper control panel.
4. When the shorting connector was used, remove it.

4-11. LTC Alignment and Full Erasure Current Check (TC-102 Board)

4-11-1. Adjustment Overview

When the TC-102 board is repaired or replaced, perform the time code system alignment.

Tools List

To perform the time code system alignment for the VTR, prepare the following equipment and fixtures.

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Audio level meter: HEWLETT-PACKARD HP3400A or equivalent
- Alignment tape: SR5-1 (Part No. 8-960-075-01) or
  SR5-1P (Part No. 8-960-075-51)

Note

Prepare either SR5-1 (for 525/60 system) or SR5-1P (for 625/50 system) in accordance with the video system to be adjusted.

- Recording tape: BCT-SX series (Betacam SX cassette)
  (Sony's standard products)

Note

For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.

Adjustment Items

Section	Item (Section title)	Adjustment point	Measurement point
4-11-2	LTC playback level check	—	TP102/TC-102(A-2)
4-11-3	LTC recording level check	—	TP100/TC-102(A-3), TP101/TC-102(A-2)
4-11-4	Full erasure current check	—	TP201/TC-102(B-1), TP200/TC-102(B-1)
4-11-5	LTC erasure current adjustment	⊘LV300/TC-102(A-1)	TP301/TC-102(B-1), TP300/TC-102(B-1)

Common Preparation

Perform the settings of control panels' switch, before starting the adjustments.
Return the all settings to the customer settings after completing the alignment.

Part	Item		Customer setting	Setting at adjustment
Upper control panel	TC:	LTC/AUTO/VISC	_____	⇨ LTC
	TC GENERATOR:	INT/EXT	_____	⇨ INT
		PRESET/REGEN	_____	⇨ REGEN
		REC RUN/REC RUN	_____	⇨ REC RUN
	REMOTE:	9P	_____	⇨ Off (Light off)
		50P	_____	⇨ Off (Light off)
Sub control panel	REC INHIBIT switch		_____	⇨ OFF
	KEY INHIBIT switch		_____	⇨ OFF

4-11-2. LTC Playback Level Check

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Alignment tape: SR5-1 (Part No. 9-960-075-01) or SR5-1P (Part No. 9-960-075-51)

Note

Prepare either SR5-2 (for 525/60 system) or SR5-1P (for 625/50 system) in accordance with the video system to be adjusted.

Preparation

1. Check the settings on the upper control panel.

REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

2. Check the setting on the sub control panel.

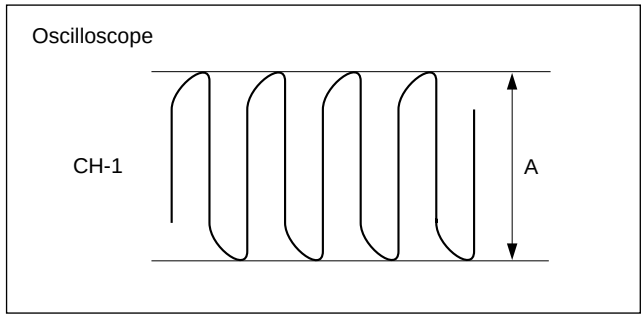
KEY INHIBIT switch ⇨ OFF

3. Check that the equipment has warmed up.

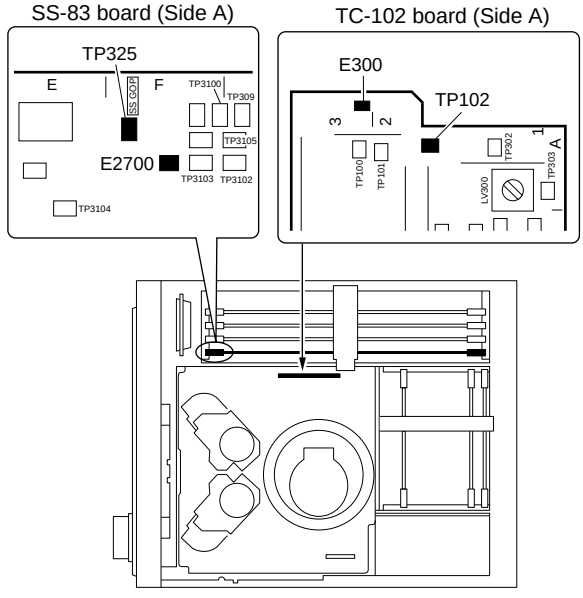
Before starting the adjustment, warm up the VTR and oscilloscope through the power for 10 minutes or more.

Playback Level Check

1. Set and connect the oscilloscope as follows:
   CH-1: TP102/TC-102(A-2), DC 100 mV/DIV
   GND: E300/TC-102(A-3)
   TIRG: TP325/SS-83(F-1), GND: E2700/SS-83(F-1)
   TIME: 100 µs/DIV
2. Insert the alignment tape SR5-1 or SR5-1P.
3. During play back the alignment tape in the following PB modes, check each level on the oscilloscope.
   PB modes: PLAY
   REW
   SHUTTLE (−5 times speed)
   SHUTTLE (−0.21 time speed)
   Specification: A ≧ 180 mV p-p (in each PB mode)



4. Eject the alignment tape.



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4-11-3. LTC Recording Level Check

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Recording tape: BCT-SX series (Betacam SX cassette) (Sony's standard products)

Note

For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.

Preparation

1. Check the settings on the upper control panel.

LTC/AUTO/VISC		⇨ LTC
INT/EXT		⇨ INT
PRESET/REGEN		⇨ REGEN
FREE RUN/REC RUN		⇨ REC RUN
REMOTE:	9P	⇨ Off (Light off)
	50P	⇨ Off (Light off)

2. Check the settings on the sub control panel.

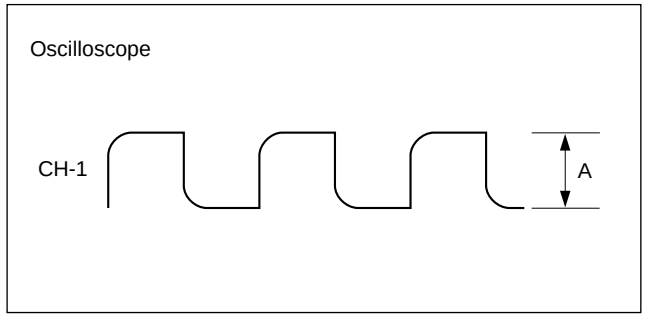
KEY INHIBIT switch	⇨ OFF
REC INHIBIT switch	⇨ OFF

3. Check that the equipment has warmed up.

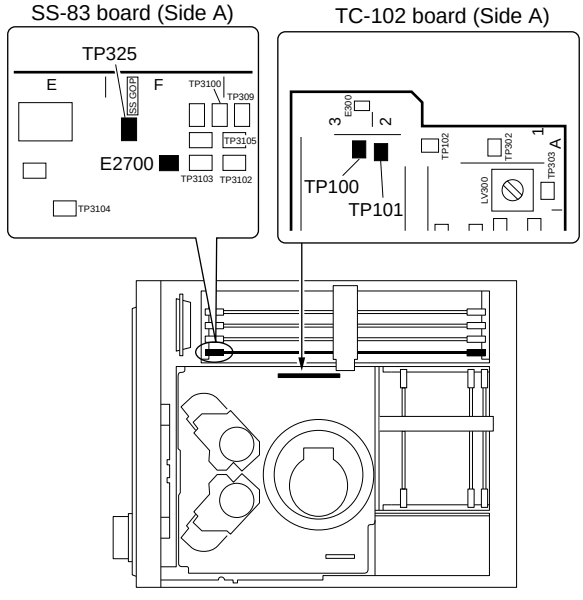
Before starting the adjustment, warm up the VTR and oscilloscope through the power for 10 minutes or more.

Recording Level Check

1. Set and connect the oscilloscope as follows:
   CH-1: TP100/TC-102(A-2), DC 100 mV/DIV
   GND: TP101/TC-102(A-3)
   TIRG: TP325/SS-83(F-1), GND: E2700/SS-83(F-1)
   TIME: 100 µs/DIV
2. Insert the recording tape.
3. Check the level on the oscilloscope in recording on the tape.
   Specification: A = 60 ±5 mV p-p



4. Eject the recording tape.



4-11-4. Full Erasure Current Check

Preparing tools

- Audio level meter:
  HEWLETT-PACKARD HP3400A or equivalent
- Recording tape: BCT-SX series (Betacam SX cassette)
  (Sony's standard products)

Note

For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advence.

Preparation

1. Check the settings on the upper control panel.

REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

2. Check the settings on the sub control panel.

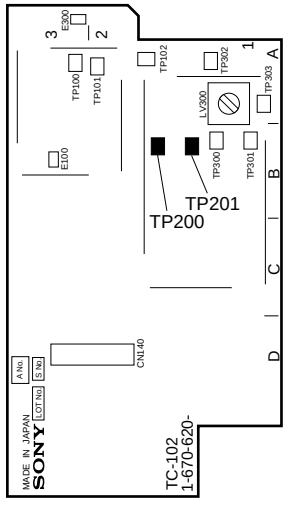
KEY INHIBIT switch ⇨ OFF
REC INHIBIT switch ⇨ OFF

3. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and audio level meter through the power for 10 minutes or more.

Full Erase Bias Current Check

1. Connect the audio level meter (V rms measurement mode) to TP201(B-1) on the TC-102 board.
   GND: TP200/TC-102(B-3)
2. Insert the recording tape.
3. Check the level on the audio level meter in recording on the tape.
   Specification: 120 mV rms or more
   (Note: 40.5 ±1.0 kHz)



TC-102 Board (Side A)

4-11-5. LTC Erasure Current Check

Preparing tools

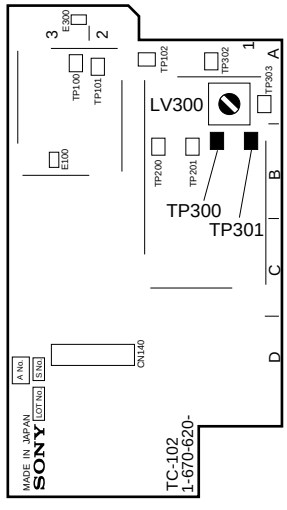
The same as Section 4-11-4

Preparation

The same as Section 4-11-4

Time Code Erase Bias Current Check

1. Connect the audio level meter (V rms measurement mode) to TP301(B-1) on the TC-102 board.
   GND: TP300/TC-102(B-1)
2. Insert the recording tape.
3. Check the level on the audio level meter in recording on the tape.
   Adj. point: ⊘LV300/TC-102(A-1)
   Specification: Maximum (110 mV rms or more: OK)
   (Note: 40.5 ±1.0 kHz)



TC-102 Board (Side A)

Section 5
Replacement of Main Parts

This section explains the replacement procedures of periodic replacement parts, main mechanical parts, power supply unit, and circuit boards.

5-1. General Information for Parts Replacement

5-1-1. Index

The parts that are explained each replacement procedure in Section 5 are as shown in the tables below.

(1) Mechanical parts and power supply unit

Items		Page
5-2.	Upper Drum Assembly Replacement	5-8
5-3.	Drum Assembly Replacement	5-17
5-4.	Brush Slip Ring Assembly Replacement	5-24
5-5.	Cleaning Roller and Video Head Cleaner Assembly Replacement	5-27
5-6.	AT Head Cleaner Replacement	5-32
5-7.	CTL Head Replacement	5-35
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5-10.	Pinch Roller Replacement	5-48
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5-17.	Reel Shift Gear Replacement	5-107
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5-19.	Tape Guide Replacement	5-117
5-20.	Tape Cleaner Replacement	5-118
5-21.	Gear Box Assembly and Threading Motor Replacement	5-120
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5-23.	S-tension Regulator Assembly Replacement	5-143
5-24.	T-tension Arm Replacement	5-145
5-25.	T Drawer Arm Replacement	5-149
5-26.	Cassette Compartment Motor Replacement	5-159
5-27.	Mechanical Adjustment Table	5-163
5-28.	Fan Motor Replacement	5-165
5-29.	Power Supply Unit Replacement	5-172
5-31.	Board Replacement in Power Supply Unit	5-204

(2) Mounted Circuit Boards

Board name	Procedure
AC-169	Refer to the exploded views.
APR-40	Plug-in board
CCM-15	Refer to “5-21. Gear Box Assembly and Threading Motor Replacement” or “5-18. Reel Shift Motor Replacement”. It is not neccessary to remove the moter and M gear.
CL-29	Refer to the exploded views.
CP-278	Section 5-30-1.
CP-301	Section 5-30-2.
CP-334	Section 5-30-3.
CP-335	Section 5-30-4.
DEC-110	Plug-in board
DPR-118	Plug-in board
DR-315	Section 5-30-5.
EQ-75	Plug-in board
FP-117	Section 5-30-6.
KY-438	Section 5-30-7.
LP-81	Refer to the exploded views.
MB-818	Section 5-30-8.
MS-58	Section 5-30-9.
PC-70	Refer to the exploded views.
PD-35	Refer to “5-11. Pinch Solenoid Replacement”.
PTC-54	Refer to “5-21. Gear Box Assembly and Threading Moter Replacement”.
PTC-59	Refer to the exploded views. Replace by the MC sensor assembly (A-8278-312-A).
PTC-69	Refer to the exploded views. After replacement, perform the electrical adjustment (Section 4-3) before install the search dial assembly on the lower control panel.
PTC-71	Refer to the exploded views.
RM-130	Section 5-30-10.
RM-179	Section 5-30-10.
RM-181	Refer to “5-15. Reel Motor Assembly Replacement”.
SDI-41	Plug-in board
SE-344	Refer to the exploded views. Replace by the reel FG assembly (A-8278-310-A). After replacement, perform the reel table rotation sensor position adjustment (Section 5-15-7).
SE-461	Section 5-30-11.
SS-83	Plug-in board
SWC-31	Section 5-30-12.
SWC-35	Section 5-30-13.
TC-102	Section 5-30-14.
TR-78	Replace by the tension regulator assembly (A-8267-795-E). (Refer to Section 5-23.)
TR-79	Section 5-30-15.
VPR-47	Plug-in board
VR-223	Section 5-30-16.
VR-224	Section 5-30-17.

- For plug-in board replacement, refer to Section 1-13.
- For the exploded views, refer to Section 2 of the maintenance manual volume 2.

5-1-2. Threading End Mode and Unthreading End Mode

1. Threading End Mode

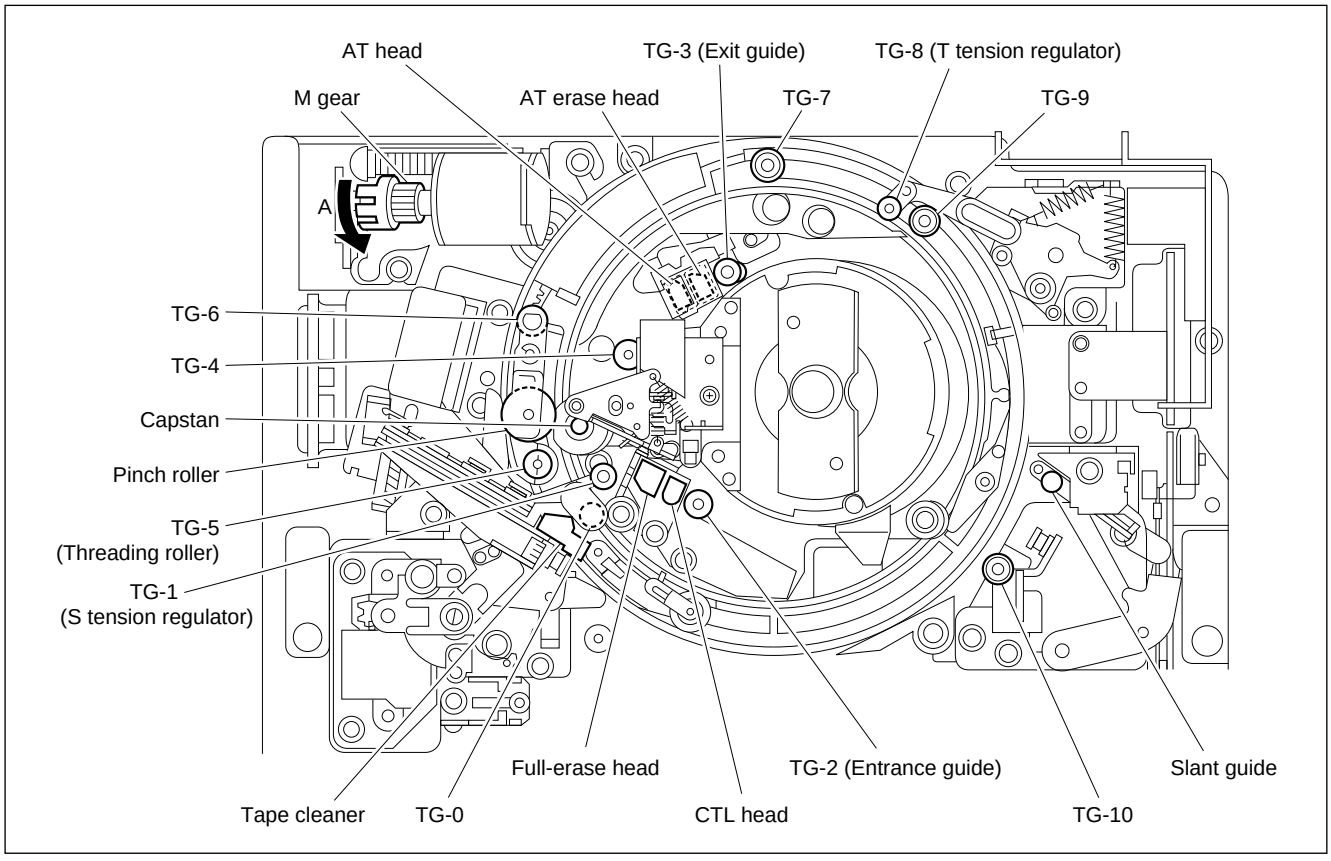
Threading end mode means that the threading ring rotates in the counterclockwise direction, then stops.

There are three ways of putting the unit into the threading end mode without installing the cassette compartment.

Method ①: Turn the power on.

Method ②: Press the STOP button under power-on state.

Method ③: Turn the M gear of the gear box assembly in the direction of the arrow A.



Threading End Mode

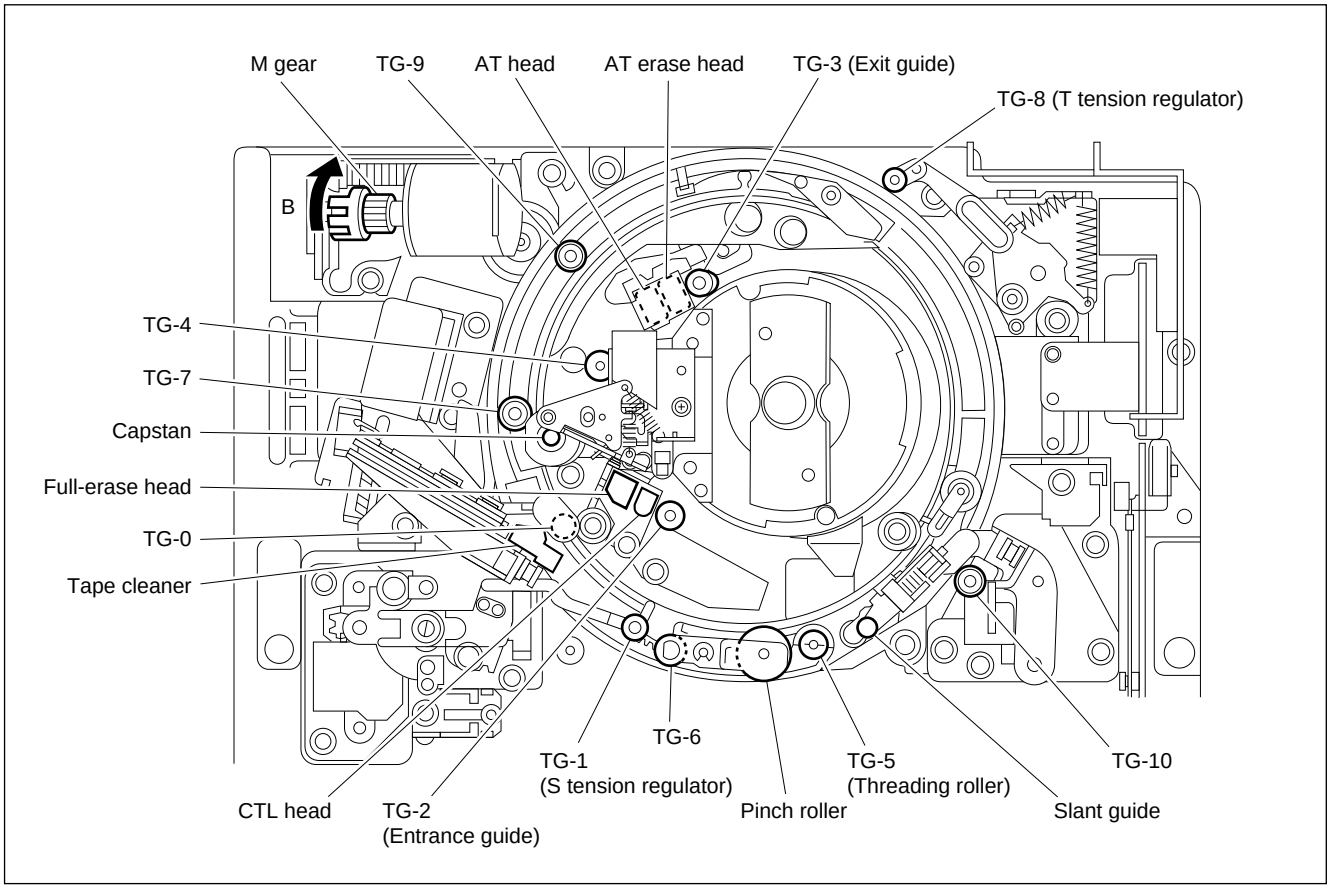
2. Unthreading End Mode

Unthreading end mode means that the threading ring rotates in the clockwise direction, then stops. (It is same state with EJECT completion mode.)

There are two ways of putting the unit into the unthreading end mode without installing the cassette compartment.

Method ①: Press the EJECT button under threading end mode.

Method ②: Turn the M gear of the gear box assembly in the direction of the arrow B.



Unthreading End Mode

5-1-3. L Cassette Position and S Cassette Position

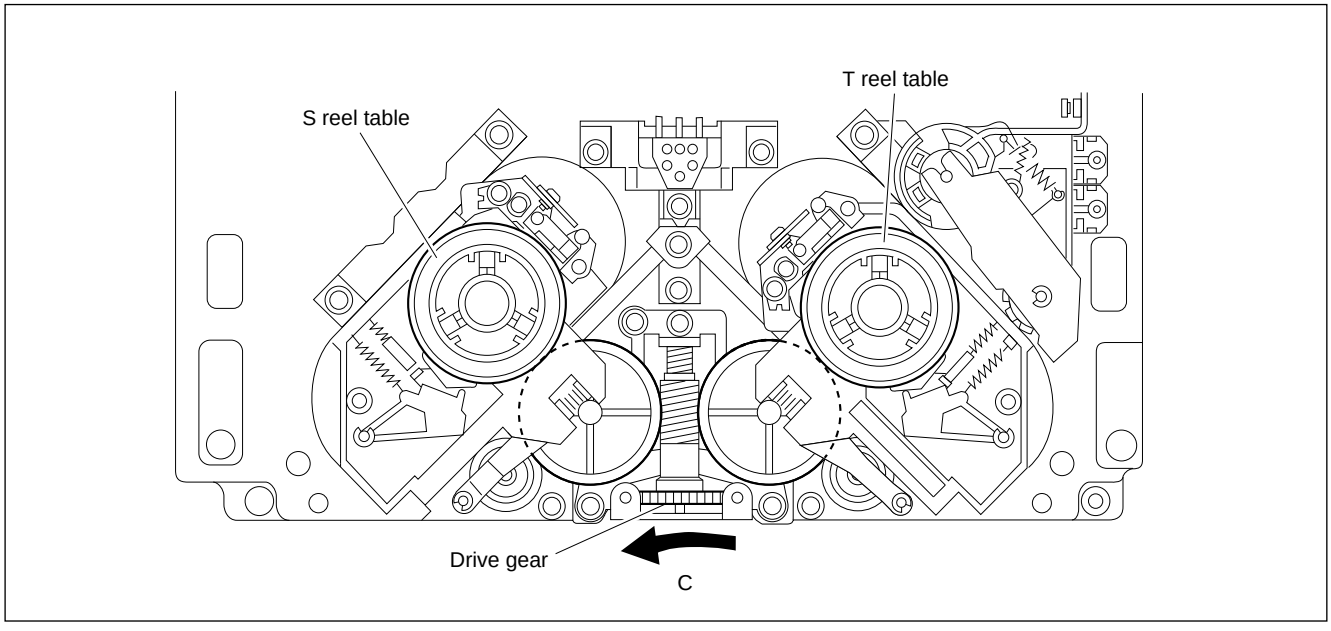
1. L Cassette Position

L cassette position means that the reel tables are in the position of L cassette tape.

There are two ways of putting the reel tables into the L cassette position without installing the cassette compartment.

Method ①: Press the switch S100 (D-1/side A) on the SS-83 board under power-on state.

Method ②: Turn the drive gear in the direction of the arrow C.



L Cassette Position

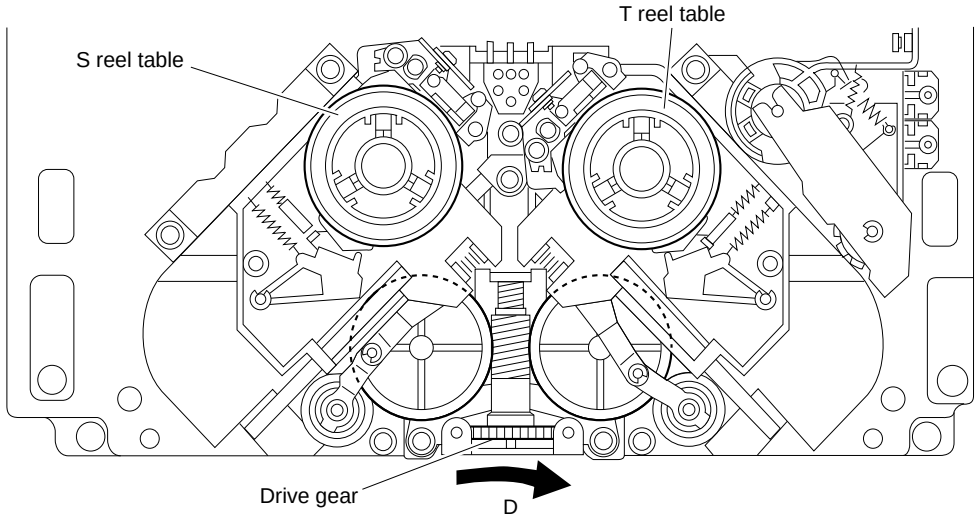
2. S Cassette Position

S cassette position means that the reel tables are in the position of S cassette tape.

There are two ways of putting the reel tables into the S cassette position without installing the cassette compartment.

Method ①: Press the switch S100 (D-1/side A) on the SS-83 board under power-on state.

Method ②: Turn the drive gear in the direction of the arrow D.



S Cassette Position

5-1-4. Basic Knowledge

1. Tape Cleaner

CAUTION

Never touch the edge of the tape cleaner with bare hands.
It is in danger of cutting your finger because the tape cleaner has a sharp edge.
Pay careful attention when replacing or adjusting the peripheral parts.

2. Tools

Clean the surface of the tool using a cleaning cloth moistened with cleaning fluid before use it.

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Be careful not to damage the tool. If the flawed tool is used, adjustment cannot be performed correctly.

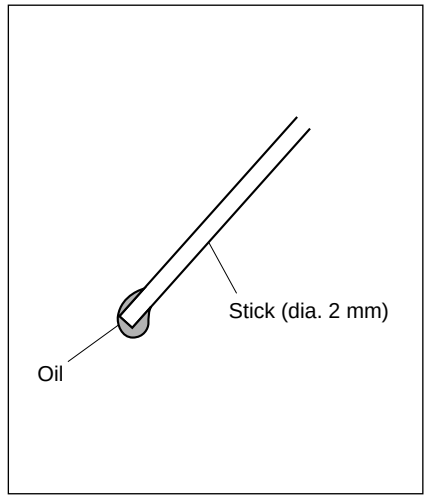
3. Note

(1) Grease and Oil

Please use only the specified grease and oil.
If the different grease or oil is used, major malfunctions may be caused due to differences in viscosity and ingredients.
And if the grease or oil that has been mixed with dust is used, major malfunctions may be caused.
Use the following grease and oil.

- Grease (SGL-505): 7-661-000-10
- Oil: 7-661-018-18

Apply just enough grease to create a thin film on the surface of the part.
Any grease that adheres to other surrounding parts must be wipe using a gauze or soft cloth.



Oil

A drop of oil is defined as follows:
About the amount that will adhere to the end of a stick 2 mm in diameter, as shown in the figure.

Do not use the grease and oil except for specified portions.

(2) Stop Washer and E Ring

It should not be used the stop washer and E ring once again.
It is recommended checking a required stop washer and E ring before replacement, and preparing more than required number.

5-2. Upper Drum Assembly Replacement

As for replacement time, refer to “Section 2. Periodic Maintenace and Inspection”.

Outline

Replacement

1. Remove the Video Head Cleaner Assembly
2. Disconnect the Flexible Board (CN2/SE-461 Board)
3. Remove the Brush Slip Ring Assembly
4. Remove the Height Determing Plate
5. Remove the Upper Drum Assembly
6. Cleaning (Upper Drum Assembly Mounting Surface, Lower Drum Flange Surface, Tape-running Surface, Lead Surface, and Contacting Points)
7. Attach the Upper Drum Assembly
8. Cleaning (Height Determining Plate’s Lower Surface and Upper Surface of Drum Support)
9. Attach the Height Determing Plate
10. Cleaning (DR-205 Board’s Contacting Points and Brush Slip Ring Assembly Mounting Surface)
11. Attach the Brush Slip Ring Assembly
12. Connect the Flexible Board (CN2/SE-461 Board)
13. Cleaning (Rotary Heads and Upper Drum’s Tape-running Surface)
14. Attach the Video Head Cleaner Assembly

Adjustment after Replacement

15. Confirm the Tape Running (Refer to Section 6-1-2.)
16. Confirm the Video Tracking (Refer to Section 6-1-3.)
17. Confirm the CTL Head Height (Refer to Section 6-1-4.)
18. Adjust the CTL Head Position (Refer to Section 6-1-5.)
19. Confirm the AT Head Height (Refer to Section 6-1-6.)
20. Adjust the AT Head Position (Refer to Section 6-1-7.)
21. Perform the Electrical Adjustments after Drum Replacement (Refer to Section 7-2.)

Note

When the rotary head tip was worn or damaged, replace the whole upper drum assembly. It cannot be replaced only head tip.

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Basic Knowledge

Replace the upper drum assembly in the following case.

- A correct RF signal waveform cannot be obtained even if the tracking adjustment is performed.

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

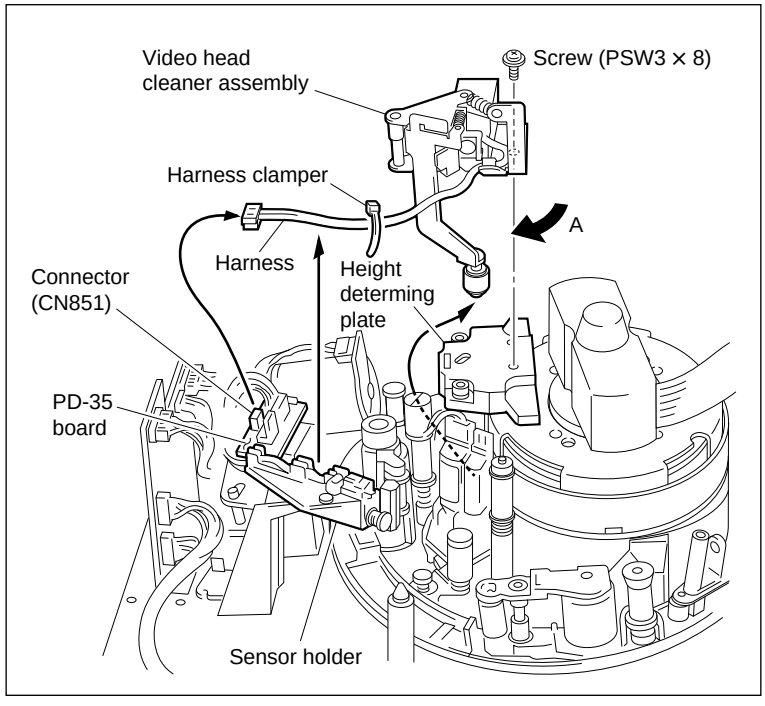
Tools

- Hexagonal wrench driver (2.5 mm): 7-700-766-04
- Torque screwdriver (6 kg•cm)(JB-5251): J-6252-510-A
- Torque screwdriver (12 kg•cm)(JB-5252): J-6252-520-A
- Torque screwdriver's bit (+2 mm, l=75 mm): J-6323-420-A
- Torque screwdriver's hexagonal bit (d=2.5 mm, l=120 mm): J-6251-090-A
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Upper drum remover: Supplied with new repair upper drum

Removal

1. Remove the Video Head Cleaner Assembly

(1) Disconnect the harness from connector CN851 on the PD-35 board.
(2) Cut the harness clamper.
(3) Remove the harness from the sensor holder.
(4) Remove the screw, shift the video head cleaner assembly in the direction indicated by the arrow A, and remove it from the height determing plate.



Remove the Video Head Cleaner Assembly

2. Disconnect the Flexible Board

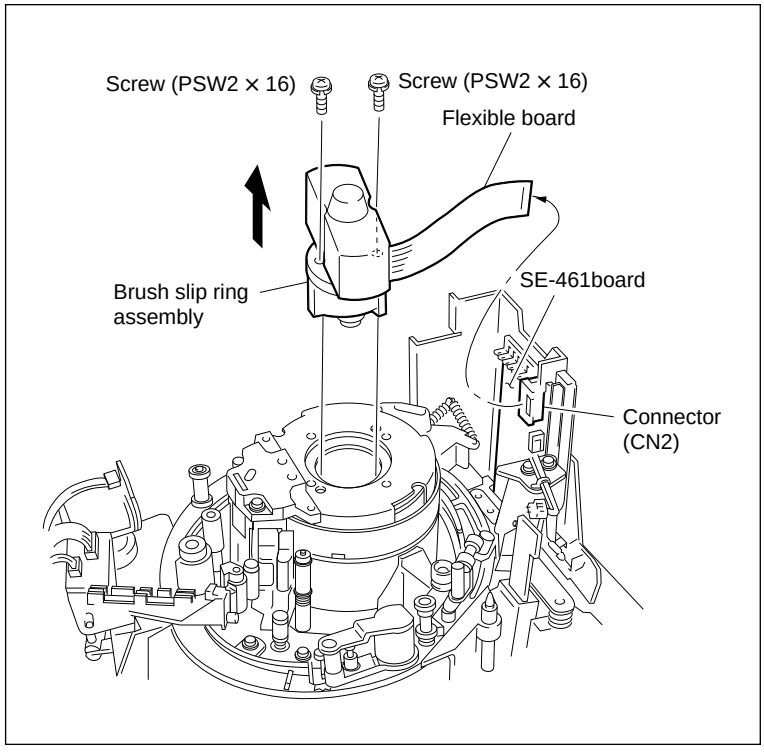
Disconnect the flexible board from connector CN2 on the SE-461 board.

3. Remove the Brush Slip Ring Assembly

Remove the two screws, then remove the brush slip ring assembly.

Notes

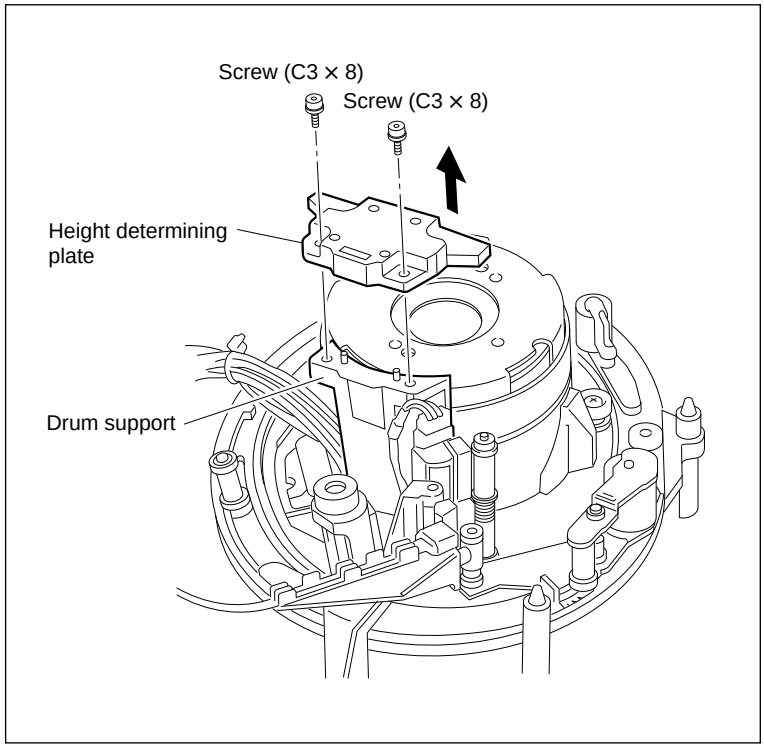
- Do not apply excessive force to the brush/slip ring assembly at that time.
- If the screws remain into the screw holes of the brush slip ring assembly, remove them once. When the brush slip ring assembly is turned upside down, these screws may be dropped into the slip ring cover.



Remove the Brush Slip Ring Assembly

4. Remove the Height Determining Plate

(1) Remove the two screws using a hexagonal wrench driver.
(2) Raise the height determining plate just above, then remove.



Remove the Height Determining Plate

5. Remove the Upper Drum Assembly

(1) Insert the hexagonal wrench driver from the screw hole (A) and completely loosen the screw.

Note

The upper drum assembly is fixed with the four fixing screws (C3 × 12) in the screw holes (A). These screws cannot be removed because of stoppers.

(2) Check that the projection of the hexagon screw from remover's surfase is 5 mm or less.

Note

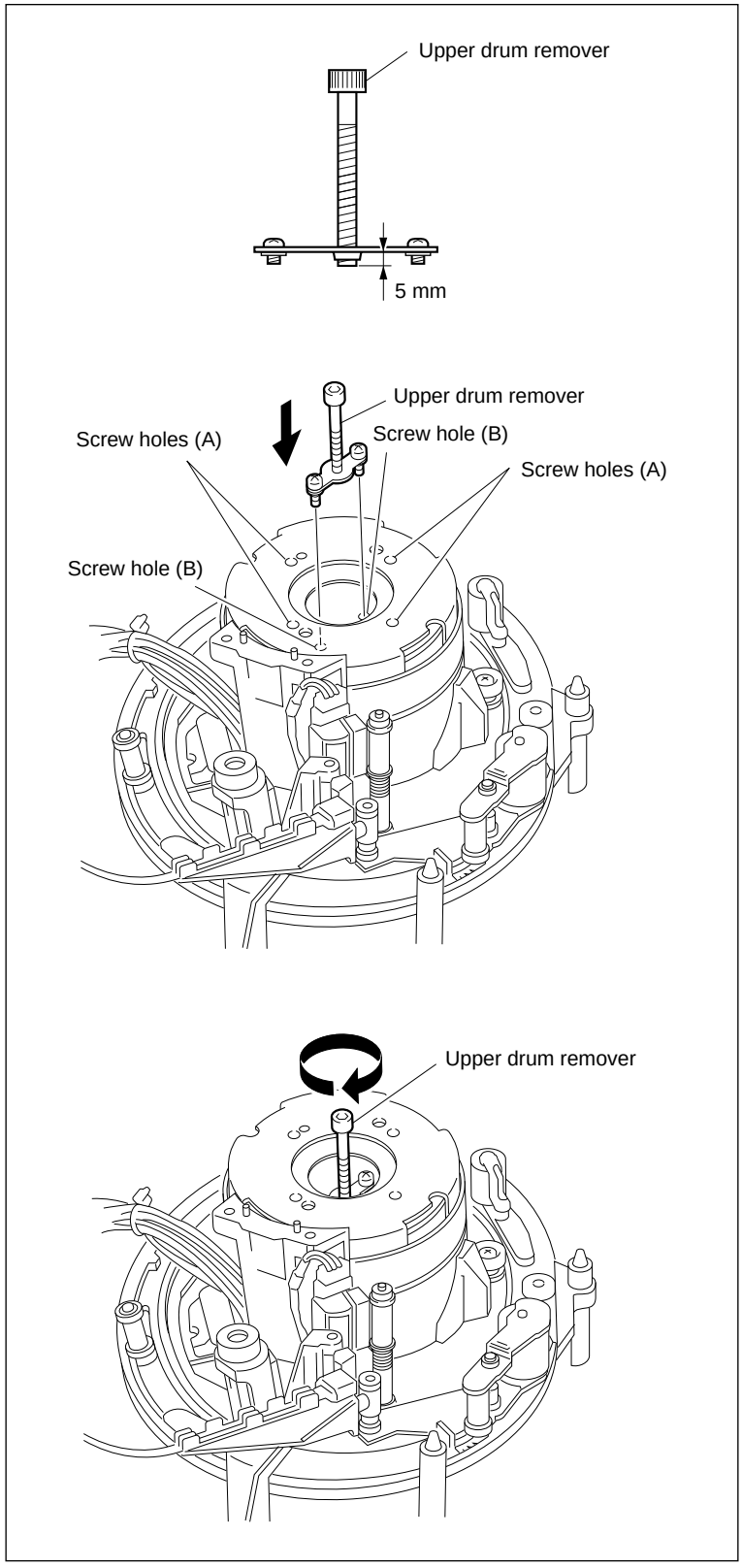
The upper drum remover is supplied with the new repair upper dum.

(3) Attach the upper drum remover to the two screw holes (B) of the brush slip ring assembly with two screws.

(4) Turn the hexagon screw of the upper drum remover clockwise by finger. The upper drum will be detached from the shaft of the lower drum slowly.

Note

If the four upper drum securing screws are not loosened completely and the hexagon screw of the upper drum remover is rotated, the lower drum may be damaged.



Remove the Upper Drum Assembly

Installation

Note

The upper drum cover is supplied with the upper drum as repair parts. And it is used for positioning of the upper drum. Never remove it in carelessly, and follow the instructions described below.

6. Cleaning

(1) Clean the portions below using a cleaning cloth moistened with cleaning fluid.
- New upper drum assembly mounting surfaces (shaded portions shown in the figure)
- Lower drum flanges (shaded portions shown in the figure) and edge portion
- Lower drum's tape-running surface and lead portion (Refer to Section 2-2-4.)

Note

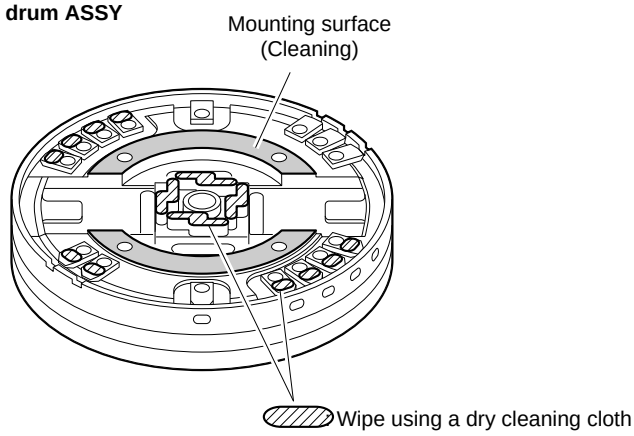
After cleaning, wipe using a dry cleaning cloth.

(2) Wipe the portions shown in figure using a dry cleaning cloth.
- 17 contacting points of upper drum
- 30 patterns of upper drum
- 20 contacting points of lower drum
- 32 patterns of lower drum

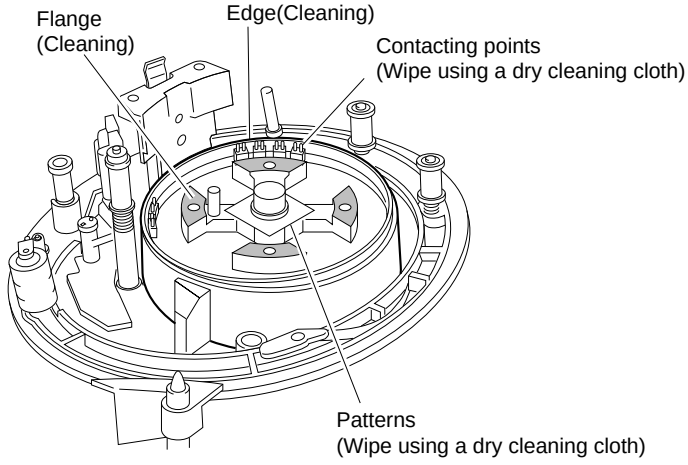
Note

Never apply cleaning fluid to the contacting points and patterns.

• Upper drum ASSY



• Lower drum



Cleaning

7. Attach the Upper Drum Assembly

Note

When replacing the upper drum of this model, it is not necessary to do an eccentricity adjustment of the upper drum.

(1) Adjust the position of the hole (A) on DR-372 board with positioning pin on the upper drum cover. (Fig. 1)
(2) Gently put the upper drum assembly on the central shaft of the lower drum while keeping the state of step (1).

Notes

- Never hold the claws of the upper drum cover when installing the upper drum assembly.
- Be careful not to touch the AT head, peripheral tape guides and drum support when installing the upper drum assembly.
- Do not turn the upper drum with the upper drum cover is installed.

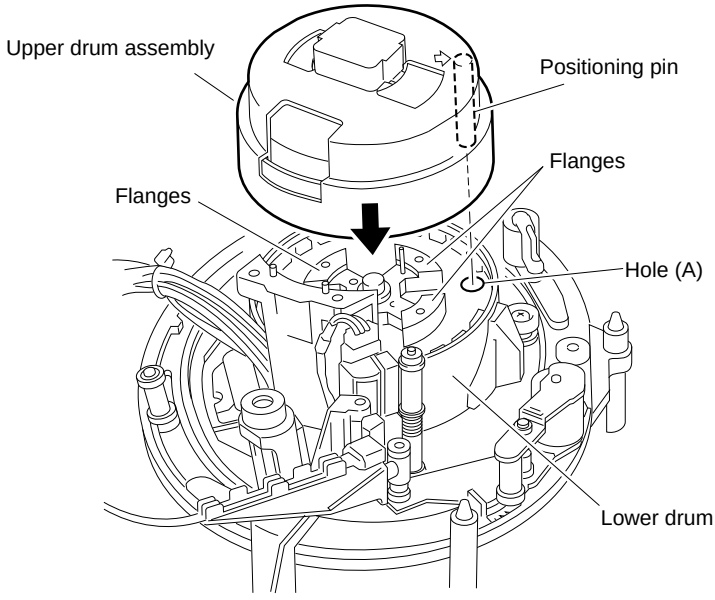
(3) Press the claws of the upper drum cover in the direction indicated by the arrows and raise the upper drum cover up, then remove it.
(4) Push the central portion of the upper drum down by finger, and surely place the upper drum on the flange of the lower drum.
(5) Gradually tighten the four screws in the sequence shown on the board cover while keeping the state of step (4).

Tightening torque: 39.2×10^{-2} N • m {4.0 kgf • cm}

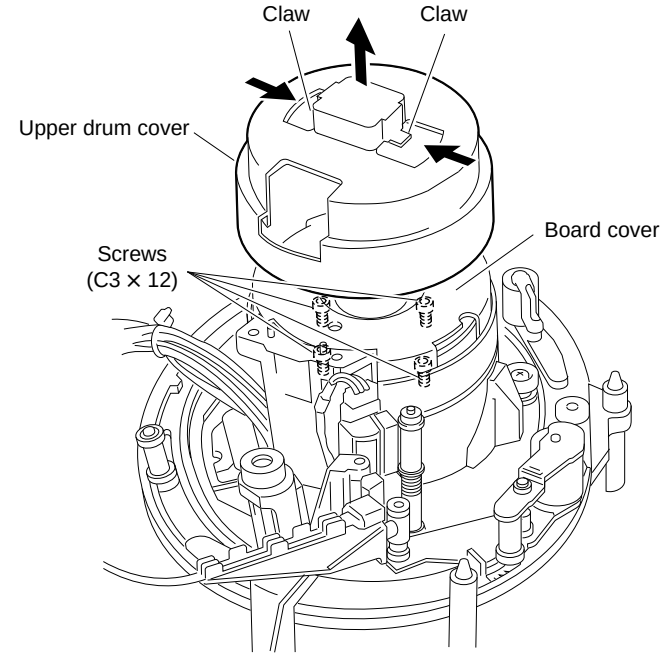
(6) Tighten the four screws in the same sequence as in step (5).

Tightening torque: 58.8×10^{-2} N • m {6.0 kgf • cm}

<Fig.1>



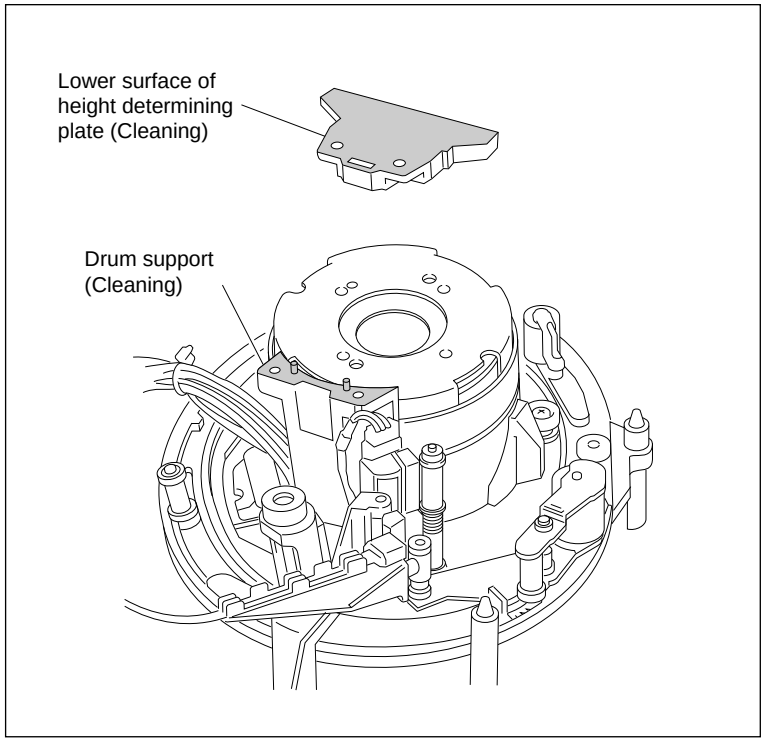
• Remove the upper drum cover



Attach the upper Drum Assembly

8. Cleaning

Clean the lower surface (shaded portion in the figure) of the height determining plate and the upper surface of the drum support (shaded portion in the figure) using a soft cloth.



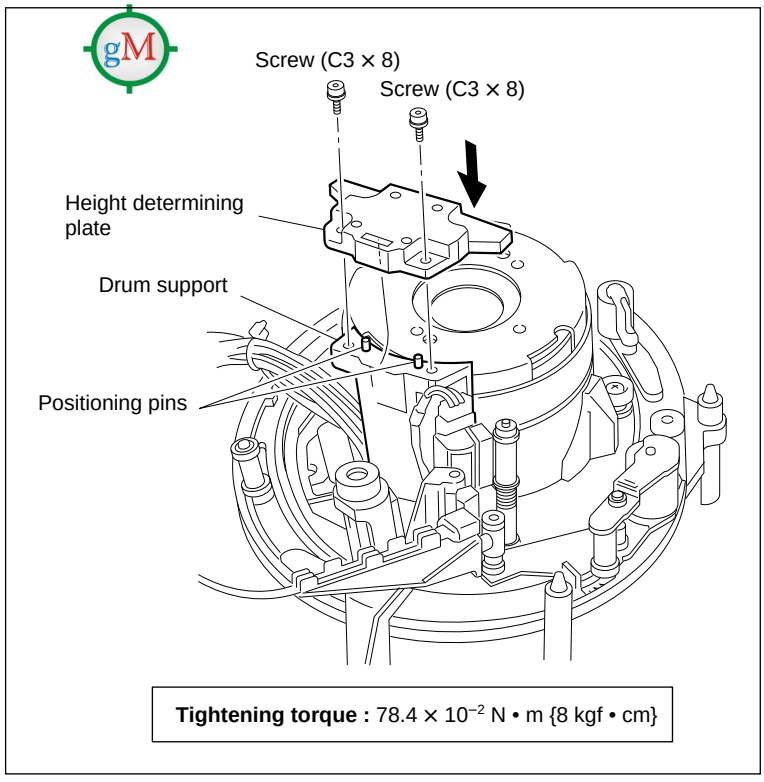
Cleaning

9. Attach the Height Determining Plate

(1) Attach the height determining plate so that the positioning pins of the drum support are put into the holes of the height determining plate.

(2) Alternately and gradually tighten the two screws.

Tightening torque: 78.4×10^{-2} N • m {8 kgf • cm}



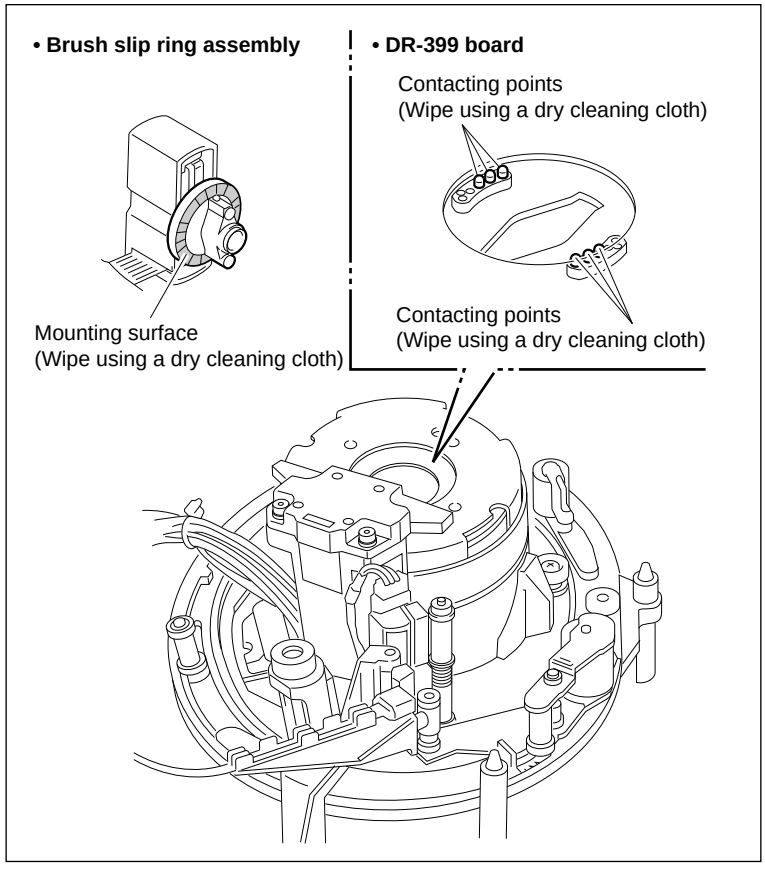
Attach the Height Determining Plate

10. Cleaning

Wipe the brush slip ring assembly mounting surface (shaded portion in the figure) and contacting points on the DR-399 board using a dry cleaning cloth.

Notes

- Do not apply cleaning fluid to the contacting points.
- If the screws remain into the screw holes of the brush slip ring assembly, remove them once. When the brush slip ring assembly is turned upside down, these screws may be dropped into the slip ring cover.


• Brush slip ring assembly
• DR-399 board
Contacting points
(Wipe using a dry cleaning cloth)
Mounting surface
(Wipe using a dry cleaning cloth)
Contacting points
(Wipe using a dry cleaning cloth)

Cleaning

11. Attach the Brush Slip Ring Assembly

(1) Attach the brush slip ring assembly in the direction shown in the figure.

(2) Alternately and gradually tighten the two screws while equally pushing both sides of the flange from above.

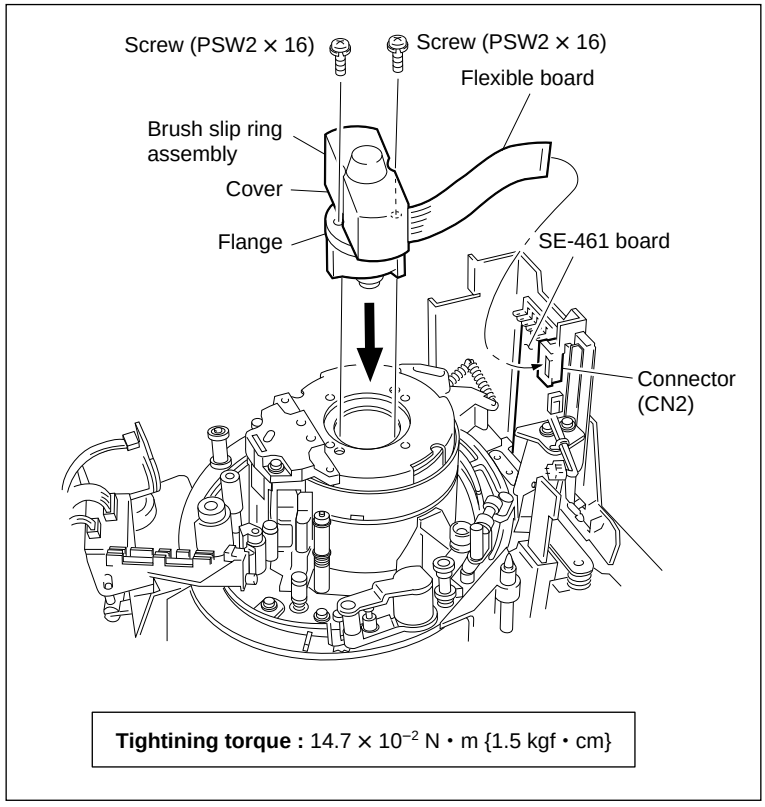
Tightening torque: 14.7×10^{-2} N • m {1.5 kgf • cm}

Note

Never apply excessive force to the cover.

12. Connect the Flexible Board

Connect the flexible board to connector CN2 on the SE-461 board, then lock.



Attach the Brush Slip Ring Assembly

13. Cleaning

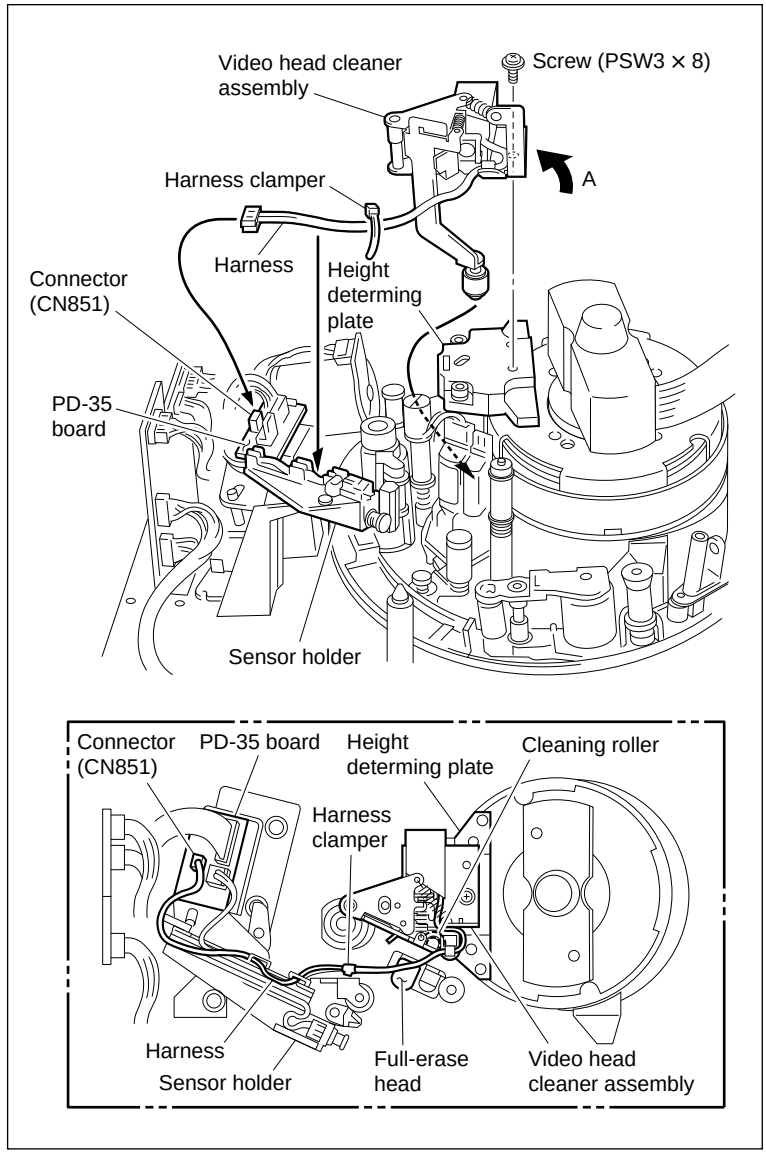
Clean the video heads and tape-running surface of the upper drum. (Refer to Section 2-2-3.)

Note

After cleaning, wipe using a dry cleaning cloth.

14. Attach the Video Head Cleaner Assembly

(1) Insert the cleaning roller into the clearance between the full-erase head and height determing plate as shown in the figure.
(2) Adjust the position of the two pins of the video head cleaner assembly with the two holes of the height determing plate.
(3) Tighten the screw while pushing the video head cleaner assembly in the direction indicated by the arrow A.
(4) Fix the harness to the position on the sensor holder as shown in the figure.
(5) Connect the harness of the video head cleaner assembly to connector CN851 on the PD-35 board.
(6) Bind the two harnesses of the full-erase head and the video head cleaner assembly with the harness cleaner (or the equivalent).
(7) Adjust the position of the cleaning roller. (Refer to step 5 in Section 5-5.)



Attach the Video Head Cleaner Assembly

Adjustment after Replacement

15. Confirm the Tape Running

Refer to Section 6-1-2.

16. Confirm the Video Tracking

Refer to Section 6-1-3.

17. Confirm the CTL Head Height

Refer to Section 6-1-4.

18. Adjust the CTL Head Position

Refer to Section 6-1-5.

19. Confirm the AT Head Height

Refer to Section 6-1-6.

20. Adjust the AT Head Position

Refer to Section 6-1-7.

21. Perform the Electrical Adjustments after Drum Replacement

Refer to Section 7-2.

5-3. Drum Assembly Replacement

As for replacement time, refer to “Section 2. Periodic Maintennace and Inspection”.

Outline

Replacement

1. Remove the Video Head Cleaner Assembly
2. Disconnect the Flexible Board (CN2/SE-461 Board)
3. Remove the Drum Assembly
4. Cleaning (Drum Assembly Mounting Surfaces and Chassis Mounting Surfaces)
5. Attach the Drum Assembly
6. Connect the Flexible Board (CN2/SE-461 Board)
7. Cleaning (Video Heads, Upper Drum’s Tape-running Surface, and Lower Drum’s Tape-running Surface)
8. Attach the Video Head Cleaner Assembly

Adjustment after Replacement

9. Confirm the Drum Motor Operation (Refer to Section 3-2-2.) (C015: DRUM MOTOR)
10. Confirm the Tape Running (Refer to Section 6-1-2.)
11. Adjust the Video Tracking (Refer to Section 6-1-3.)
12. Adjust the CTL Head Height (Refer to Section 6-1-4.)
13. Adjust the CTL Head Position (Refer to Section 6-1-5.)
14. Adjust the AT Head Height (Refer to Section 6-1-6.)
15. Adjust the AT Head Position (Refer to Section 6-1-7.)
16. Confirm the LTC Level in REV Mode (Refer to Section 6-1-8.)
17. Confirm the Tape Running (Refer to Section 6-1-2.)
18. Perform the Electrical Adjustment after Drum Replacement (Refer to Section 7-2.)

Note

Be careful not to damage the AT head and peripheral tape guides when removing or installing the drum assembly.

Basic knowledge

Replace the drum assembly in the following cases.

- The upper or lower drum’s tape-running surface is damaged and cannot be repaired.
- A correct RF signal waveform cannot be obtained due to the worn upper or lower drum even if the tracking adjustment is performed.
- The VTR performance deteriorates because of the noise or jitter caused by the bearing life.

Preparation

1. Turn the power off.
2. Remove the Upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

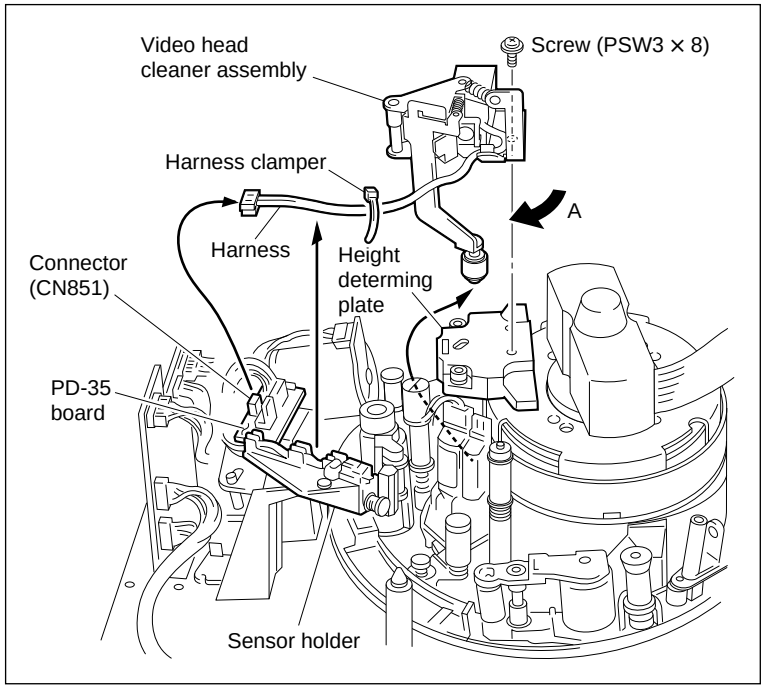
Tools

- Hexagonal wrench driver (2.5 mm): 7-700-766-04
- Torque screwdriver (6 kg•cm)(JB-5251): J-6252-510-A
- Torque screwdriver (12 kg•cm)(JB-5252): J-6252-520-A
- Torque screwdriver's hexagonal bit (d=2.5 mm, l=120 mm): J-6251-090-A
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Removal

1. Remove the Video Head Cleaner Assembly

(1) Disconnect the harness from connector CN851 on the PD-35 board.
(2) Cut the harness clamper.
(3) Remove the harness from the sensor holder.
(4) Remove the screw, shift the video head cleaner assembly in the direction indicated by the arrow A, and remove it from the height determing plate.



Remove the Video Head Cleaner Assembly

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2. Disconnect the Flexible Board

Disconnect the flexible board from connector CN2 on the SE-461 board.

3. Remove the Drum Assembly

(1) Rotate the upper drum assembly manually counterclockwise and align the position of the mark "⇨" indicated on the board cover with the lower drum fixing screw.

Note

The drum assembly is fixed to the chassis with the three fixing screws (C3 × 8) in the screw hole.

(2) Fully loosen the screw using a hexagonal wrench driver.

Note

These screws cannot be removed because of stoppers.

(3) Rotate the upper drum counterclockwise by finger and fully loosen other two screws in the same way as in steps (1) and (2).

(4) Raise the drum assembly just above and remove the two harnesses from the harness holders at the bottom.

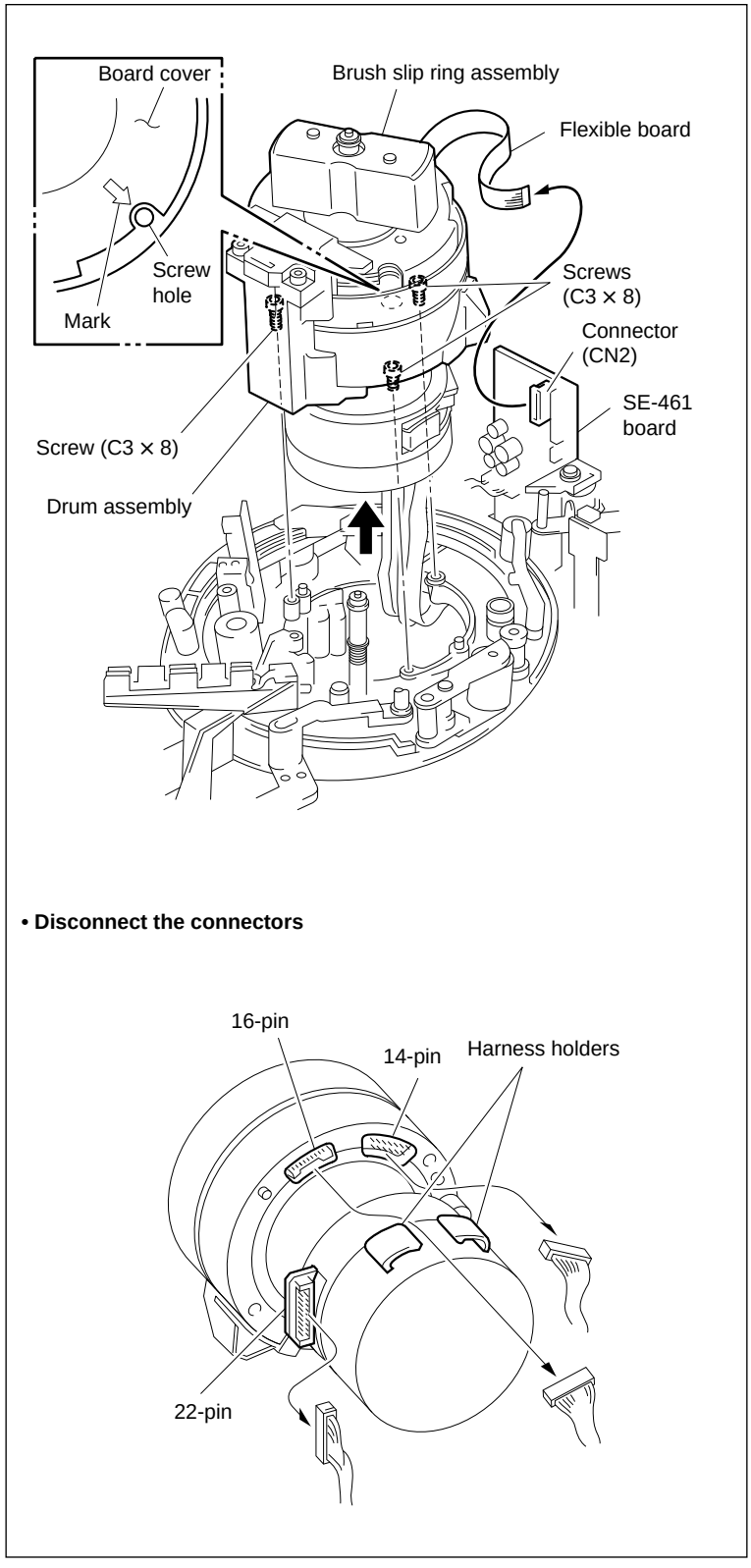
Note

Be careful not to raise the drum assembly by holding the brush slip ring assembly.

(5) Disconnect the three harnesses in the state of step (4). Then the drum assembly can be removed.

Note

Be careful not to touch the AT head and peripheral tape guides when removing the drum assembly.



Remove the Drum Assembly

Installation

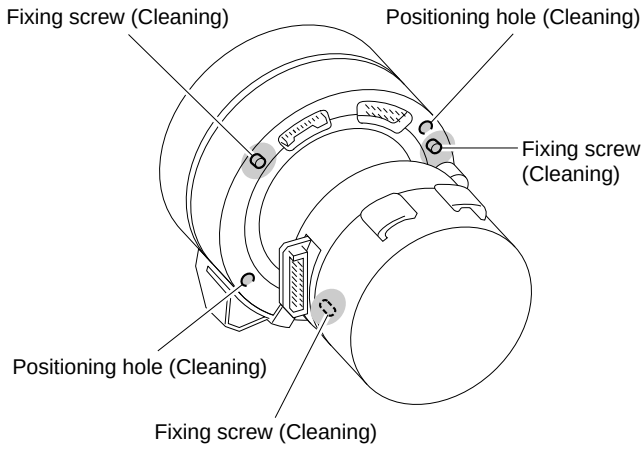
4. Cleaning

Clean a new drum assembly mounting surfaces and chassis mounting surfaces using a cleaning cloth moistened with cleaning fluid.

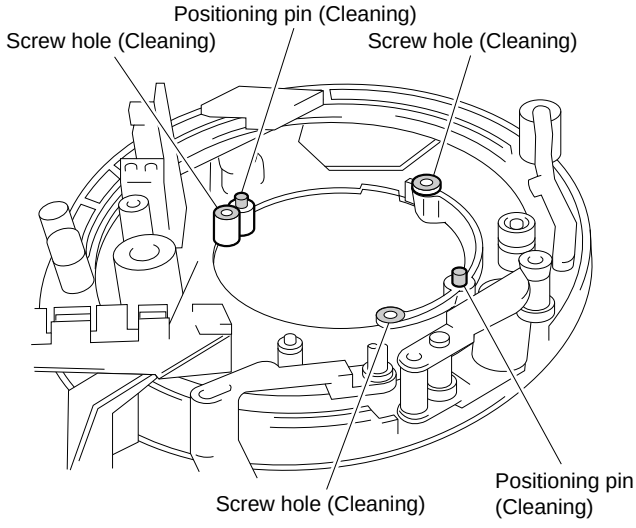
Note

After cleaning, wipe using a dry cleaning cloth.

• Drum assembly



• Chassis



Cleaning

5. Attach the Drum Assembly

(1) Hold the drum support and connect the three connectors disconnected in (6) of step 3.

Notes

- Hold the height determining plate and the drum support at that time. Be careful not to hold the upper drum and the brush slip ring assembly.
- Pay attention to the direction of the connectors.

(2) Fix each of the two harnesses with the harness holder as shown in the figure.

(3) Adjust the two positioning holes of the drum assembly with the two positioning pins of the chassis, and install it to the chassis while passing the harnesses under the chassis.

Notes

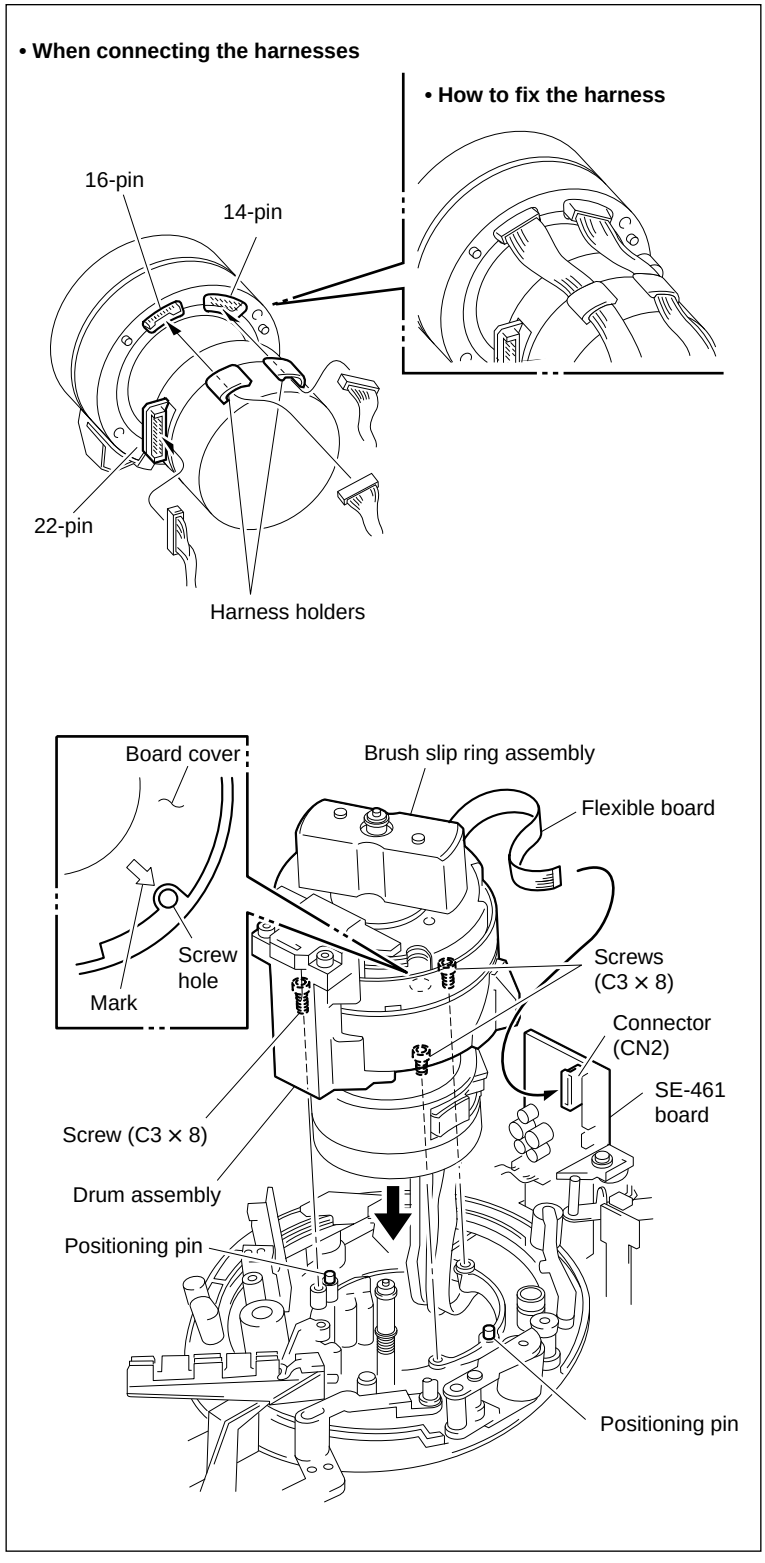
- Be careful not to touch the AT head and tape guide at that time.
- Be careful not to put the harness between the lower drum and the chassis.

(4) Confirm that the drum assembly is firmly inserted into the positioning pins.
(5) Rotate the upper drum assembly manually counterclockwise and align the position of the mark "⇨" indicated on the board cover with the fixing screw.
(6) Tentatively tighten the screw.
(7) Tentatively tighten other two screws in the same way as in steps (5) and (6).
(8) Gradually tighten the three screws in the order of counterclockwise.

Tightening torque: 78.4×10^{-2} N • m
{8 kgf • cm}

6. Connect the Flexible Board

Connect the flexible board to connector CN2 on the SE-461 board, then lock.



Attach the Drum Assembly

7. Cleaning

Clean the portions below.

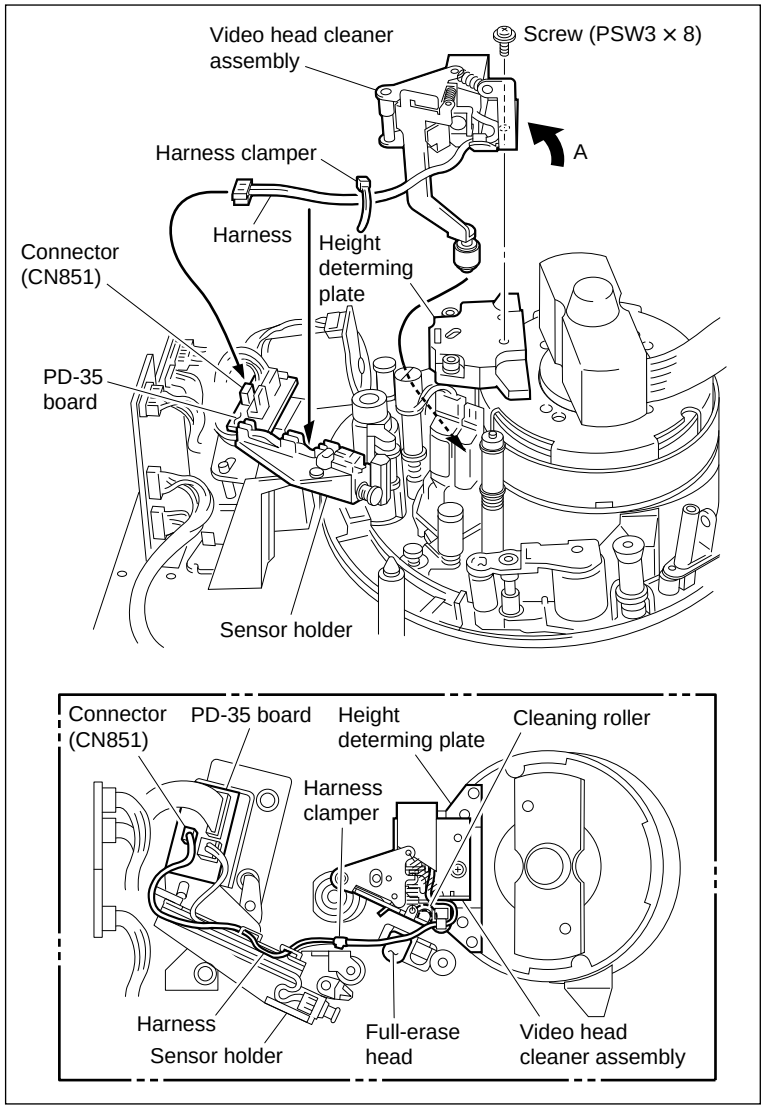
- Video heads and tape-running surface of the upper drum. (Refer to Section 2-2-3.)
- Lower drum's tape-running surface and lead portion. (Refer to Section 2-2-4.)

Note

After cleaning, wipe using a dry cleaning cloth.

8. Attach the Video Head Cleaner Assembly

(1) Insert the cleaning roller into the clearance between the height determing plate and full-erase head as shown in the figure.
(2) Adjust the position of the two pins of the video head cleaner assembly with the two holes of the height determing plate.
(3) Tighten the screw while pushing the video head cleaner assembly in the direction indicated by the arrow A.
(4) Fix the harness to the position on the sensor holder as shown in the figure.
(5) Connect the harness to connector CN851 on the PD-35 board.
(6) Bind the two harnesses the full-erase head and the video head cleaner assembly with a new harness clamper.
(7) Adjust the position of the cleaning roller. (Refer to step 5 in Section 5-5.)



Attach the Video Head Cleaner Assembly

Adjustment after Replacement

9. Confirm the Drum Motor Operation
Refer to Section 3-2-2. (C015: DRUM MOTOR)

10. Confirm the Tape Running
Refer to Section 6-1-2.

11. Adjust the Video Tracking
Refer to Section 6-1-3.

12. Adjust the CTL Head Height
Refer to Section 6-1-4.

13. Adjust the CTL Head Position
Refer to Section 6-1-5.

14. Adjust the AT Head Height
Refer to Section 6-1-6.

15. Adjust the AT Head Position
Refer to Section 6-1-7.

16. Confirm the LTC Level in REV Mode
Refer to Section 6-1-8.

17. Confirm the Tape Running
Refer to Section 6-1-2.

18. Perform the Electrical Adjustment after Drum Replacement
Refer to Section 7-2.

5-4. Brush Slip Ring Assembly Replacement

Replace the brush slip ring assembly every 6,000 hours of the drum rotation.

Outline

Replacement

1. Disconnect the Flexible Board (CN2/SE-461 Board)
2. Remove the Brush Slip Ring Assembly
3. Cleaning (Contact Portion of the DR-399 Board and the Mounting Surface of Brush Slip Ring Assembly)
4. Attach the Brush Slip Ring Assembly
5. Connect the Flexible Board (CN2/SE-461 Board)

Adjustment after Replacement

6. RF Check (Refer to Section 3-2-3.) (C1: RF CHECK)

Note

Replace the brush slip ring assembly when the brush or slip ring is worn or damaged. The brush slip ring assembly cannot be replaced by only the brush or slip ring.

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment assembly. (Refer to Section 1-5.)

Tools

- Torque screwdriver (6 kg•cm)(JB-5251): J-6252-510-A
- Torque screwdriver's bit (+2 mm, l = 75 mm): J-6323-420-A
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Removal

1. Disconnect the Flexible Board

Disconnect the flexible board from the connector CN2 on the SE-461 board.

2. Remove the Brush Slip Ring Assembly

(1) Remove the two screws, then remove the brush slip ring assembly.

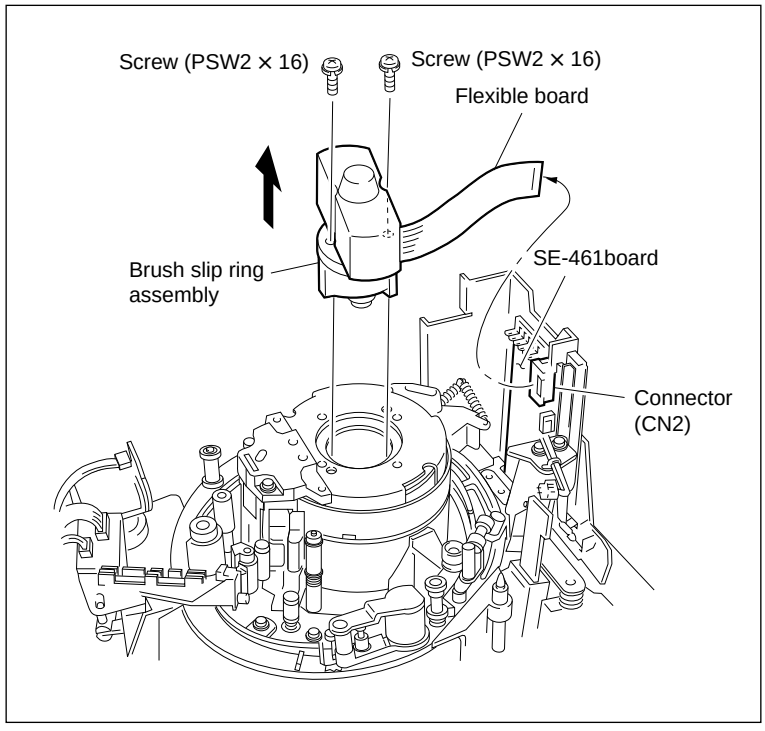
Note

Do not apply any force forcibly to the brush slip ring assembly at that time.

(2) Turn the brush slip ring assembly upside down and take out the screws.

Note

Be careful not to drop the screws in the cover at that time.



Remove the Brush Slip Ring Assembly

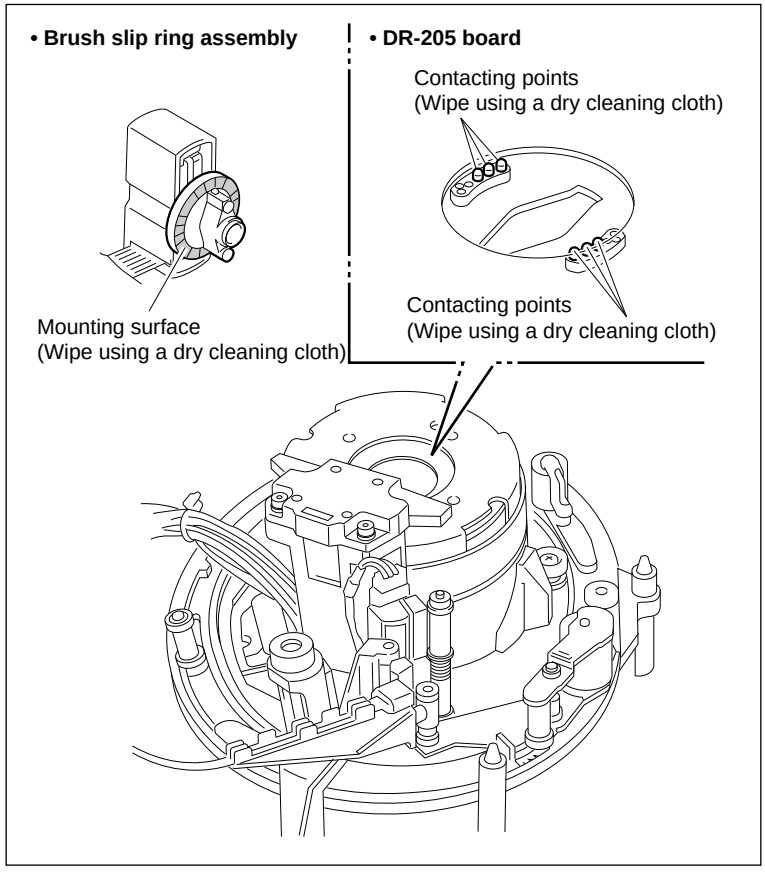
Installation

3. Cleaning

Wipe the mounting surface (the portion in the figure) of the brush slip ring assembly and the contacting points of the DR-399 board using a dry cleaning cloth.

Note

Never apply cleaning fluid to the contact portions.

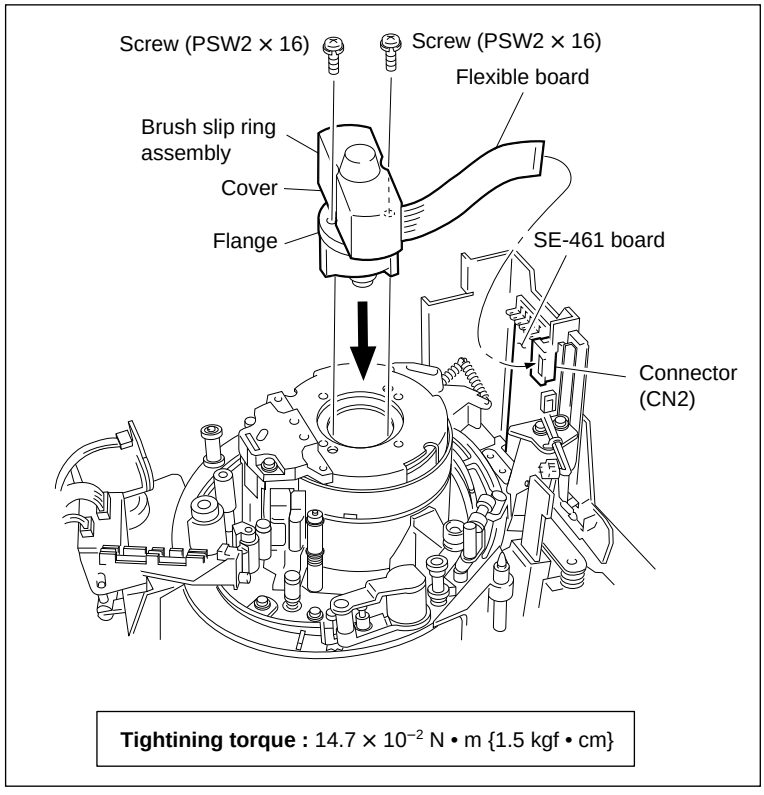

• Brush slip ring assembly
• DR-205 board
Contacting points (Wipe using a dry cleaning cloth)
Mounting surface (Wipe using a dry cleaning cloth)
Contacting points (Wipe using a dry cleaning cloth)

Cleaning

4. Attach the Brush Slip Ring Assembly

(1) Insert the two screws taken out in (2) of step 2 into the screw holes of the brush slip ring assembly.
(2) Attach the brush slip ring assembly in the direction shown in the figure.
(3) Alternately and gradually tighten the two screws while uniformly pushing both sides of the flange.

Tightening torque: 14.7×10^{-2} N • m {1.5 kgf • cm}



Attach the Brush Slip Ring Assembly

5. Connect the Flexible Board

Insert the flexible board to the connector CN2 on the SE-461 board, then lock.

Adjustment after Replacement

6. RF Check

Refer to Section 3-2-3.
(C1: RF CHECK)

5-5. Cleaning Roller and Video Head Cleaner Assembly Replacement

Replace the cleaning roller every 6,000 hours of the drum rotating.
Replace the video head cleaner assembly ealier time either 6,000 hours of the drum rotating or 200,000 times of the threading.
The cleaning roller is included in the video head cleaner assembly.

Outline

Replacement

1. Remove the Harness (CN851/PD-35 Board)
2. Remove the Video Head Cleaner Assembly
3. Replace the Cleaning Roller
4. Attach the Video Head Cleaner Assembly
5. Adjust the Cleaning Roller Position
6. Connect the Harness (CN851/PD-35 Board)

Adjustment after Replacement

7. Confirm the Cleaning Solenoid Operation (Refer to Section 3-2-2.)
   (C023: CLEANING ROLLER)

Note

When the cleaning roller is replaced, it is recommended to replace the CR spacer at the same time.
CR spacer: 3-182-765-02

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

Removal

1. Remove the Harness

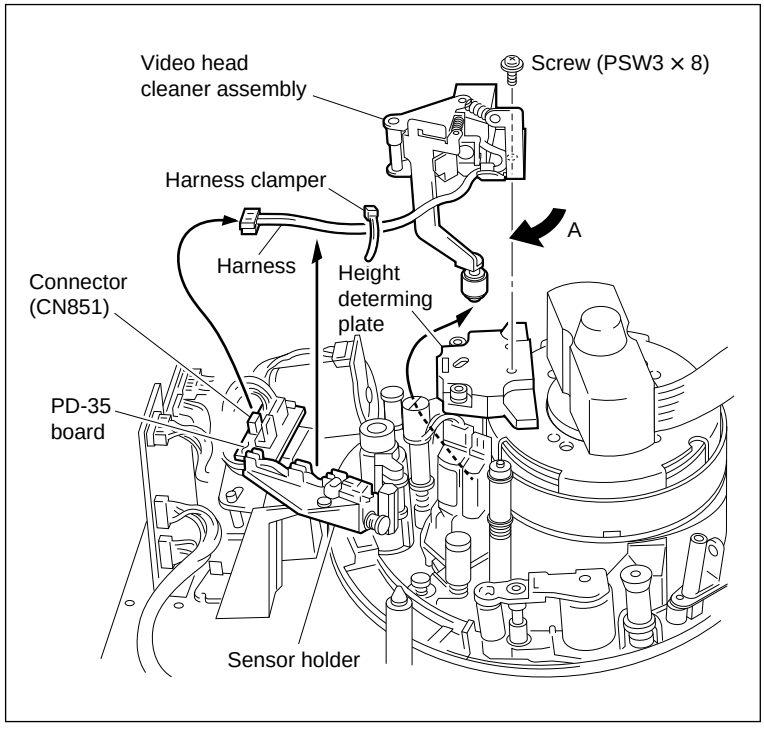
(1) Disconnect the harness from connector CN851 on the PD-35 board.
(2) Cut the harness clamper.
(3) Remove the harness from the sensor holder.

2. Remove the Video Head Cleaner Assembly

Remove the screw, shift the video head cleaner assembly in the direction indicated by the arrow A, and remove it from the height determing plate.

Note

Perform step 5 and later when replacing the video head cleaner assembly.
Perform step 3 and later when replacing the cleaning roller.



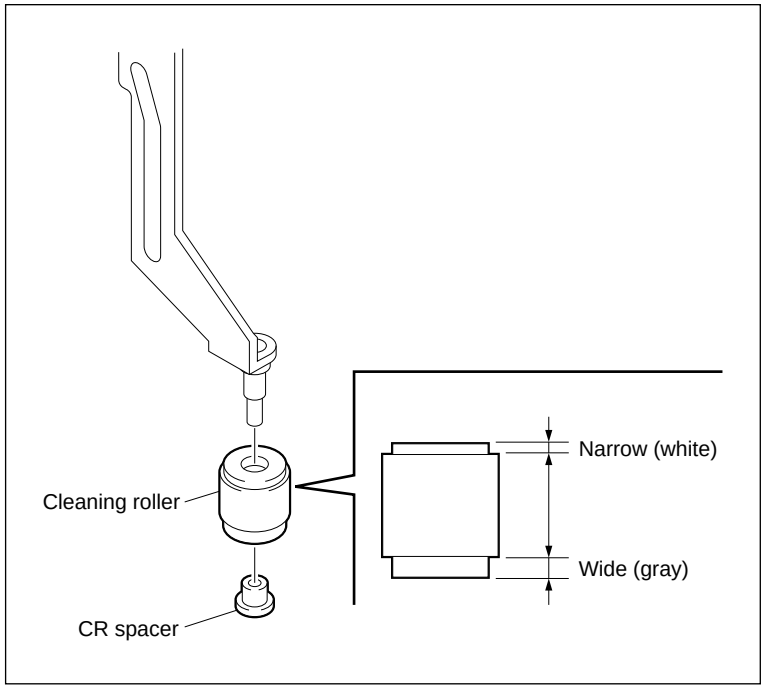
Remove the Video Head Cleaner Assembly

3. Replace the Cleaning Roller

(1) Remove the CR spacer, and remove the cleaning roller.
(2) Pass a new cleaning roller through the shaft as shown in the figure. Then fix the cleaning roller by new CR spacer.
(3) Move the cleaning roller in the vertical direction.
At this time, confirm that there is no vertical play.

Note

Do not reverse the direction of the cleaning roller. The height between the cleaing roller and head is shifted in this case.



Replace the Cleaning Roller

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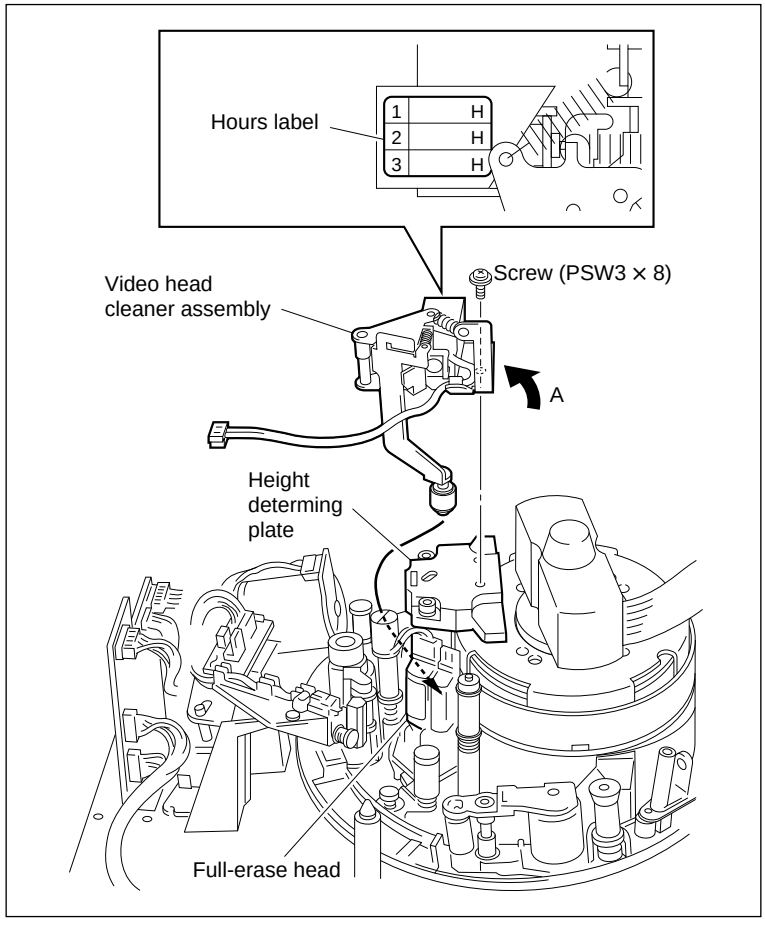
Installation

4. Attach the Video Head Cleaner Assembly

(1) Insert the cleaning roller from the clearance between the height determing plate and the full-erase head.
(2) Align the two pins of the video head cleaner assembly with the two holes of the height determing plate.
(3) Tighten the screw while moving the video head cleaner assembly in the direction indicated by the arrow A (counterclookwise).
(4) Fill in the hours of the cleaning roller replacement on the hours label sticked on the video head cleaner assembly.



Attach the Video Head Cleaner Assembly

5. Adjust the Cleaning Roller Position

(1) Check that the cleaning roller does not come in contact with the upper drum as visual. (Specification 1)

If the cleaning roller comes in contact with the upper drum, bend the portion B of the arm plate assembly in the direction of the arrow C.

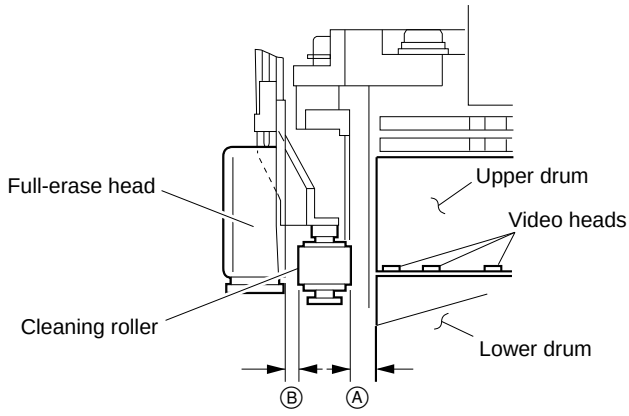
(2) Check that the cleaning roller does not come in contact with the terminal on the full-erase head as visual. (Specification 2)

If the cleaning roller comes in contact with the terminal on the full-erase head, bend the portion B of the arm plate assembly in the direction of the arrow D.

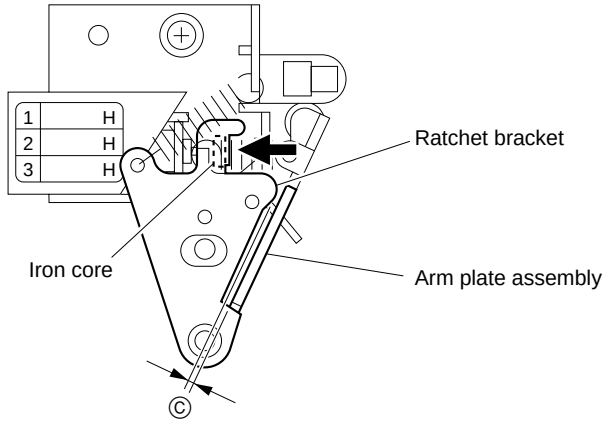
(3) Press the iron core in the direction of the arrow. At that time, check that clearance exists between the ratchet bracket and the arm plate assembly. (Specification 3)

If clearance does not exist, bend the portion B of the arm plate assembly in the direction of the arrow D.

(4) Repeat steps (1) through (3) above until the specifications 1 through 3 are satisfied.

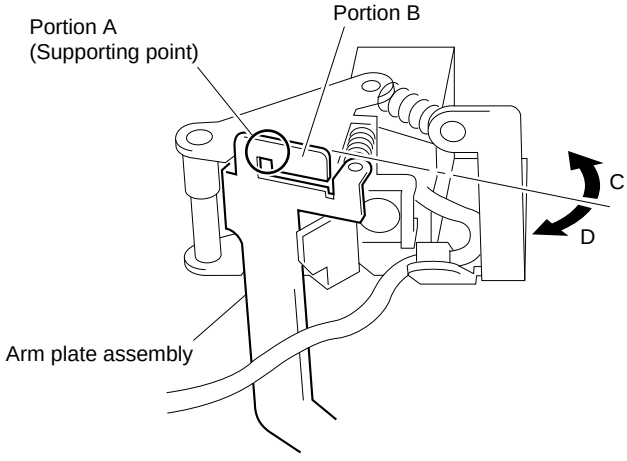


Spec. 1 : Ⓐ = Clearance exists.
Spec. 2 : Ⓑ = Clearance exists.



Spec. 3 : Ⓒ = Clearance exists.

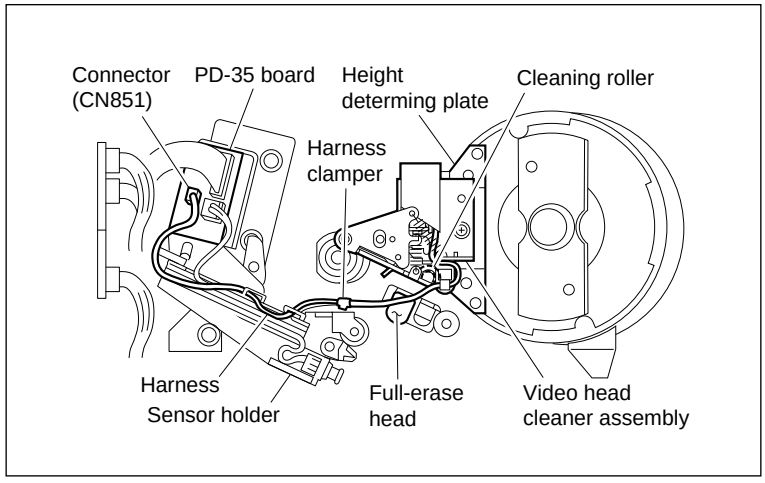
• When the specifications 1or 2 are not satisfied.



Adjust the Cleaning Roller Position

6. Connect the Harness

(1) Fix the harness to the position on the sensor holder as shown in the figure.
(2) Connect a harness of the video head cleaner assembly to connector CN851 on the PD-35 board.
(3) Bind the two harnesses of the video head cleaner assembly and the full-erase head with a new harness clamper (or equivalent).



Connect the Harness

Adjustment after Replacement

7. Confirm the Cleaning Solenoid Operation

Refer to Section 3-2-2.
(C023: CLEANING ROLLER)

5-6. AT Head Cleaner Replacement

Replace the AT head cleaner every 2,000 hours of drum rotating.

Outline

Replacement

1. Remove the CL Arm Assembly
2. Attach the CL Arm Assembly
3. Confirm the CL Arm Assembly Operation

Note

1. When the cleaning roller is dirty or damaged, replace the CL arm assembly.
2. Adjustment after the CL arm assembly replacement is not required. However, confirm the CL arm assembly operation.
3. When replacing the CL arm assembly, prepare a new stop washer.
   Stop washer (2.3): 3-669-596-00

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

Removal

1. Remove the CL Arm Assembly

(1) Turn the M gear of the gear box assembly manually and move the CL arm assembly to the position shown in the figure.

Note

Move the CL arm assembly to the front of the SE-461 board. If not, the CL arm assembly cannot be removed because the stop washer is hidden by other parts.

(2) Remove the stop washer at the top of the CL arm assembly.

(3) Remove the CL arm assembly from the threading ring.

Note

Do not remove the spring at the bottom of the CL arm from the shaft.

Installation

2. Attach the CL Arm Assembly

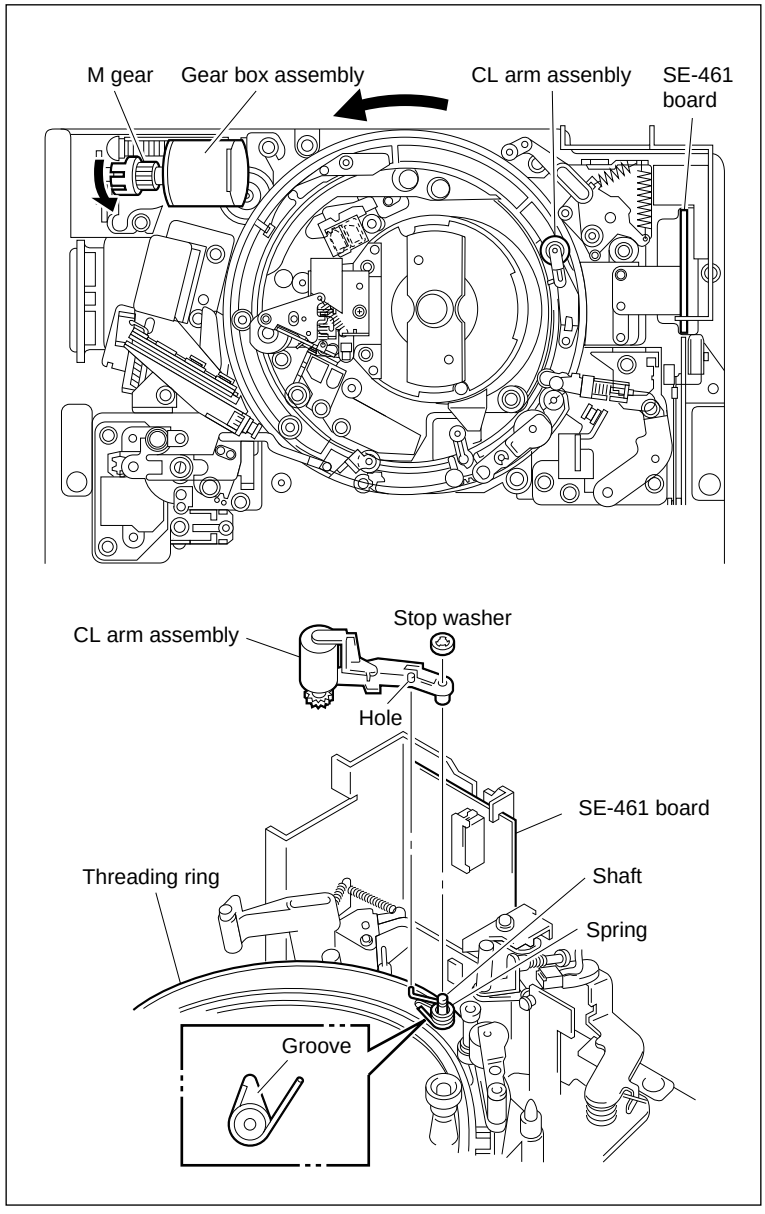
(1) Pass a new CL arm assembly through the shaft while hooking the spring as shown in the figure.

Note

Insert the short-end of the spring into the groove of the threading ring and the long-end spring into the hole of the CL arm assembly.

(2) Fix the CL arm assembly by new stop washer.

Stop washer (2.3) : 3-669-596-00



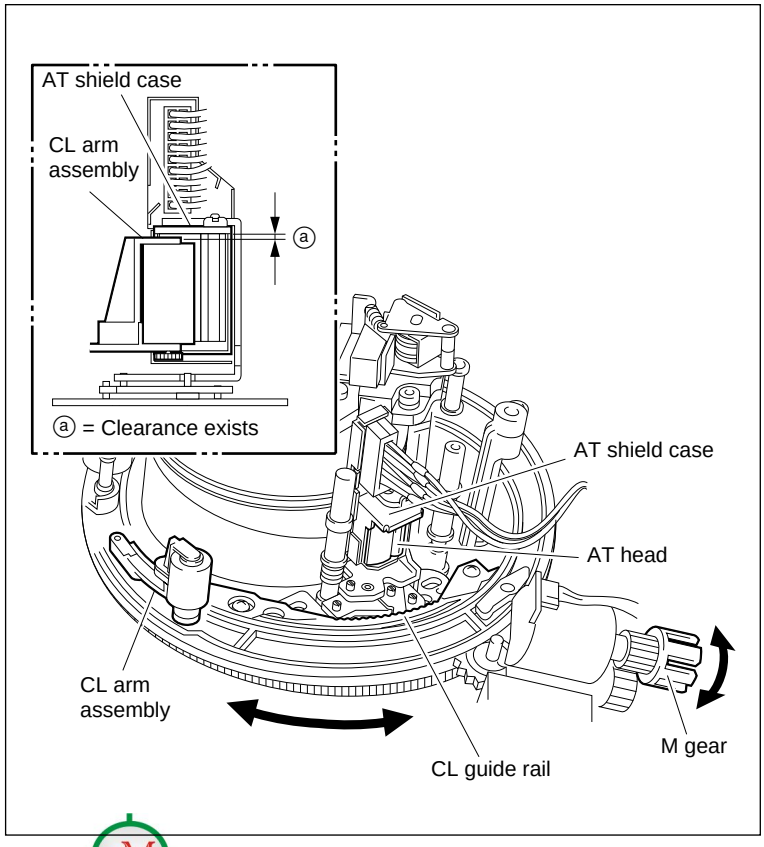
Remove the CL Arm Assembly

3. Confirm the CL Arm Assembly Operation

(1) Turn the M gear of the gear box assembly manually and confirm the items below while repeating the threading and unthreading.

- The CL arm assembly moves along the CL guide rail.
- The cleaning roller cleans the AT head.
- A clearance exists between the CL arm assembly and shield case while the AT head is cleaned.

(2) Turn the power on and confirm that the CL arm assembly smoothly operates while repeating the threading and unthreading.



gM **Confirm the CL Arm Assembly Operation**

5-7. CTL Head Replacement

Outline

Replacement

1. Disconnect the Harnesses
2. Remove the CTL/FE Head Assembly
3. Remove the CTL Head
4. Mount the CTL Head
5. Attach the CTL/FE Head Assembly
6. Connect the Harnesses
7. Cleaning (Surfaces of Full-erase Head and CTL Head)

Adjustment after Replacement

8. Confirm the Tape Running (Refer to Section 6-1-2.)
9. Adjust the CTL Head Height (Refer to Section 6-1-4.)
10. Adjust the CTL Head Position (Refer to Section 6-1-5.)
11. Confirm the Tape Running (Refer to Section 6-1-2.)
12. Confirm the AT Head Position (Refer to Section 6-1-7.)
13. Adjust the Drum Phase (Refer to Section 7-2-3.)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Torque screwdriver (6 kgf•cm) (JB-5251): J-6252-510-A
- Torque screwdriver's bit (+2 mm, l = 75 mm): J-6323-420-A

Removal

1. Disconnect the Harnesses

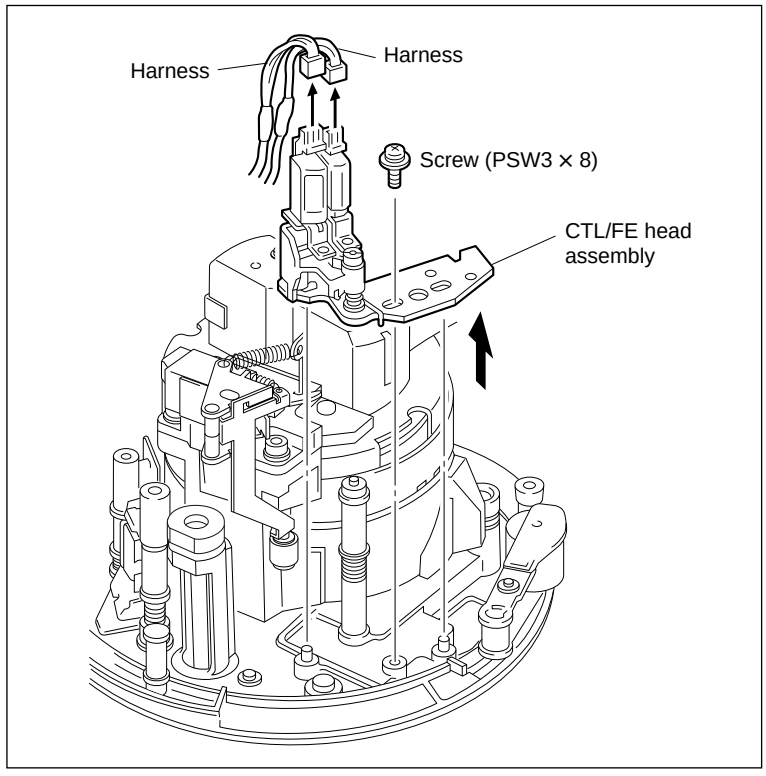
Disconnect the two harnesses from connectors of the CTL/FE head assembly.

2. Remove the CTL/FE Head Assembly

Remove the screw, then remove the CTL/FE head assembly.

Note

Be careful not to touch the drum (especially, video heads). Also, take care not to damage the peripheral tape guides.



Remove the CTL/FE Head Assembly

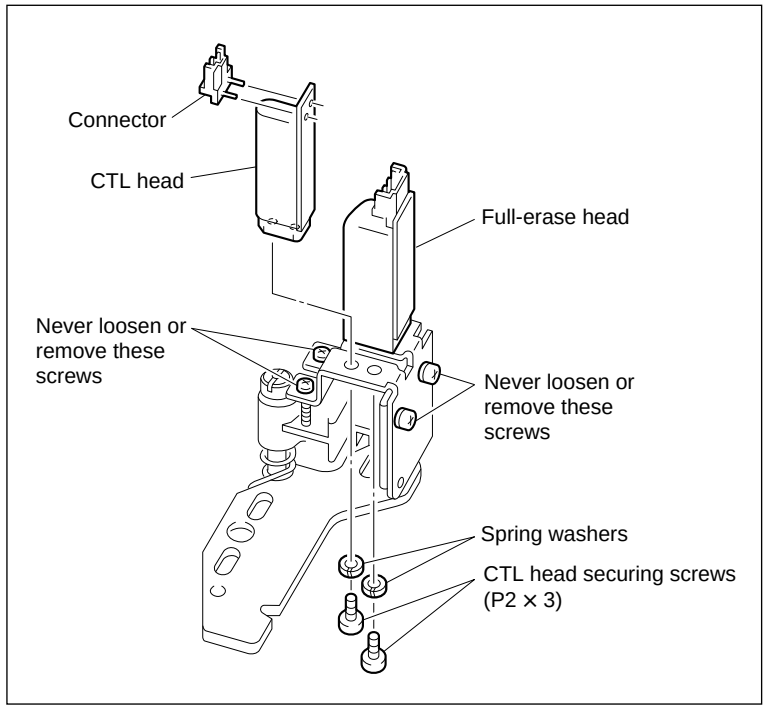
3. Remove the CTL Head

(1) Remove the two CTL head securing screws, then remove the CTL head.

Notes

- When removing the CTL head, be careful not to damage the full-erase head.
- Never loosen or remove the screws except for the CTL head securing screws. If these screws are loosened or removed, the zenith of the CTL and the full-erase heads will be out of specification.

(2) Unsolder and remove the connector from the CTL head's PC board.



Remove the CTL Head

Installation

4. Mounting the CTL Head

(1) Solder the connector to the PC board of a new CTL head board.

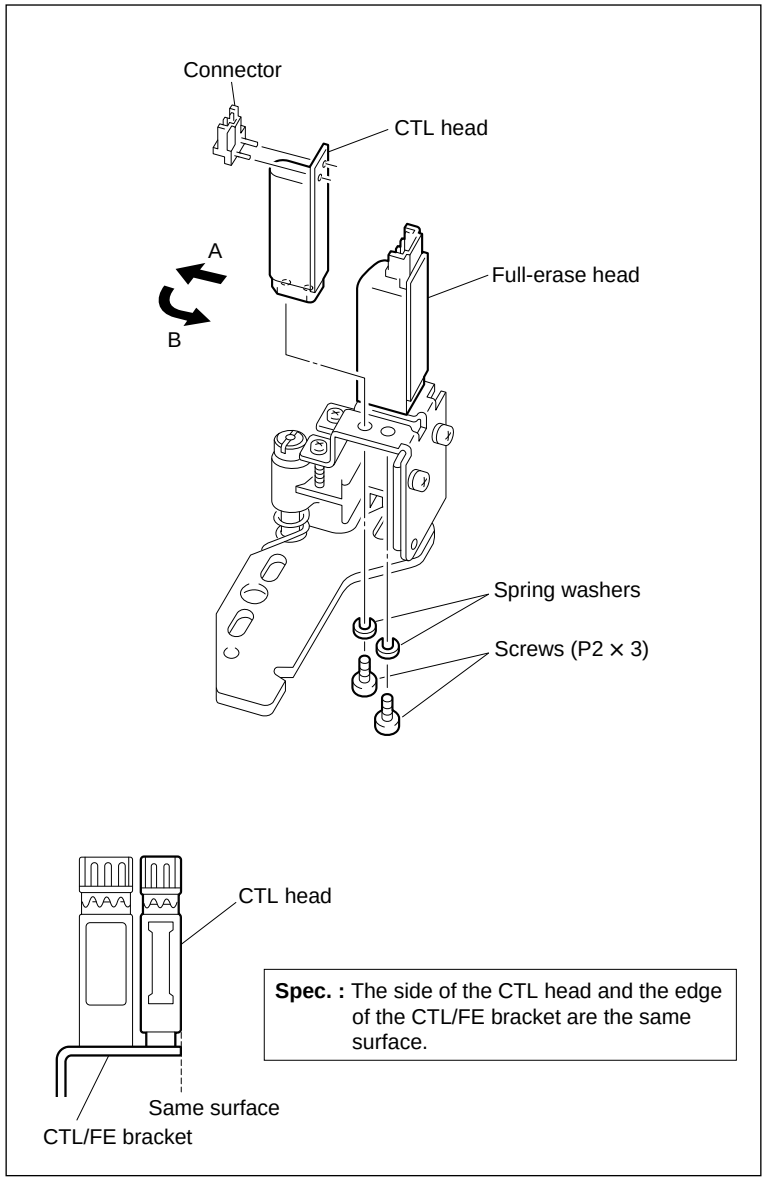
(2) Temporarily tighten the two screws while moving the CTL head in the direction indicated by arrows A and B.

Note

Be careful not to damage the CTL head and full-erase head.

(3) Tighten the two screws if it is within the specification.

Tightening torque: 19.6×10^{-2} N • m {2.0 kgf • cm}



Mount the CTL Head

5. Attach the CTL/FE Head Assembly

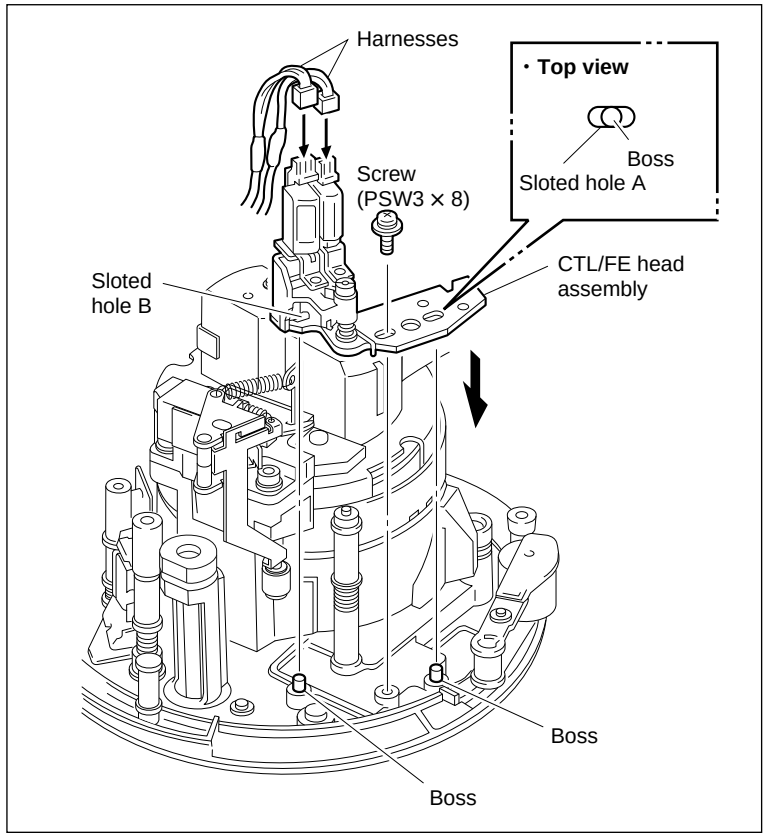
(1) Confirm that the threading ring is in the unthreading end state.

(2) Put the sloted holes A and B of the CTL/FE head assembly into the bosses of the chassis.

Note

Be careful not to touch the drum (especially, video heads). Also, take care not to damage the peripheral tape guides.

(3) Place the boss of the chassis in the center of the sloted hole A and tighten the screw.



Attach the CTL/FE Head Assembly

6. Connect the Harnesses

Connect the two harnesses to the connectors of CTL/FE head assembly.

7. Cleaning

Clean the tape-running surfaces of the CTL head and the full-erase head using a cleaning cloth moistened with cleaning fluid.
(Refer to Section 2-2-5.)

Adjustment after Replacement

8. Confirm the Tape Running

Refer to Section 6-1-2.

9. Adjust the CTL Head Height

Refer to Section 6-1-4.

10. Adjust the CTL Head Position

Refer to Section 6-1-5.

11. Confirm the Tape Running

Refer to Section 6-1-2.

12. Confirm the A/T Head Position

Refer to Section 6-1-7.

13. Adjust the Drum Phase

Refer to Section 7-2-3.

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5-8. Full-erase Head Replacement

Outline

Replacement

1. Disconnect the Harnesses
2. Remove the CTL/FE Head Assembly
3. Remove the Full-erase Head
4. Mount the Full-erase Head
5. Attach the CTL/FE Head Assembly
6. Connect the Harnesses
7. Cleaning (Surfaces of Full-erase Head and CTL Head)

Adjustment after Replacement

8. Adjust the Tape Running (Refer to Section 6-1-2.)
9. Confirm the CTL Head Height (Refer to Section 6-1-4.)
10. Adjust the CTL Head Position (Refer to Section 6-1-5.)
11. Confirm the Tape Running (Refer to Section 6-1-2.)
12. Confirm the AT Head Position (Refer to Section 6-1-7.)
13. Adjust the Drum Phase (Refer to Section 7-2-3.)
14. Confirm the Full-erase Current (Refer to Section 4-11-4.)

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment assembly. (Refer to Section 1-5.)

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Torque screwdriver (6 kg•cm)(JB-5251): J-6252-510-A
- Torque screwdriver's bit (+2 mm, l = 75 mm): J-6323-420-A

Removal

1. Disconnect the Harnesses

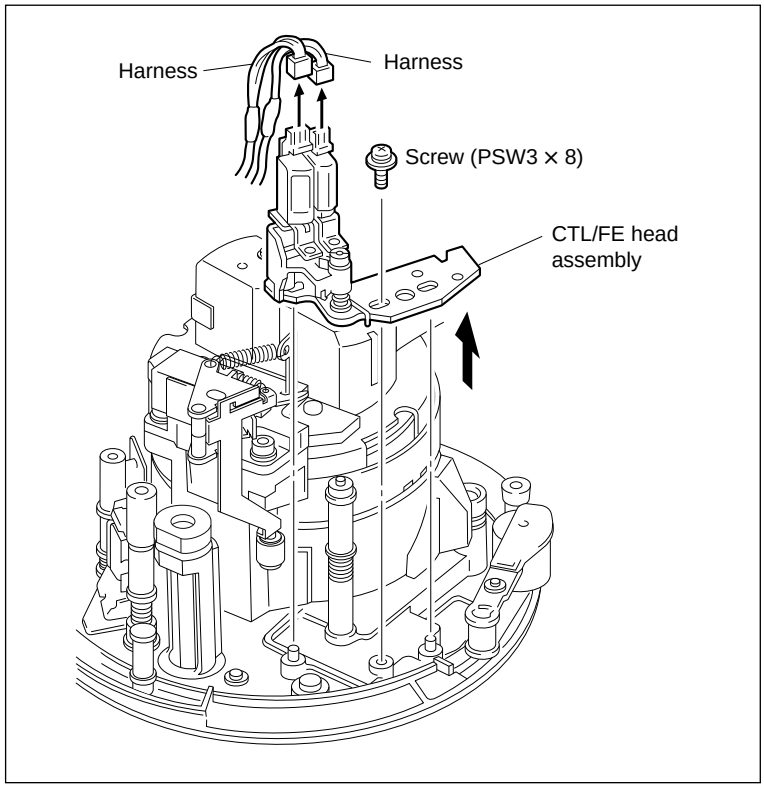
Disconnect the two harnesses from the connectors of the CTL/FE head assembly.

2. Remove the CTL/FE Head Assembly

Remove the screw, then remove the CTL/FE head assembly.

Note

Be careful not to touch the drum (especially, video heads). Also, take care not to damage the peripheral tape guides.



Remove the CTL/FE Head Assembly

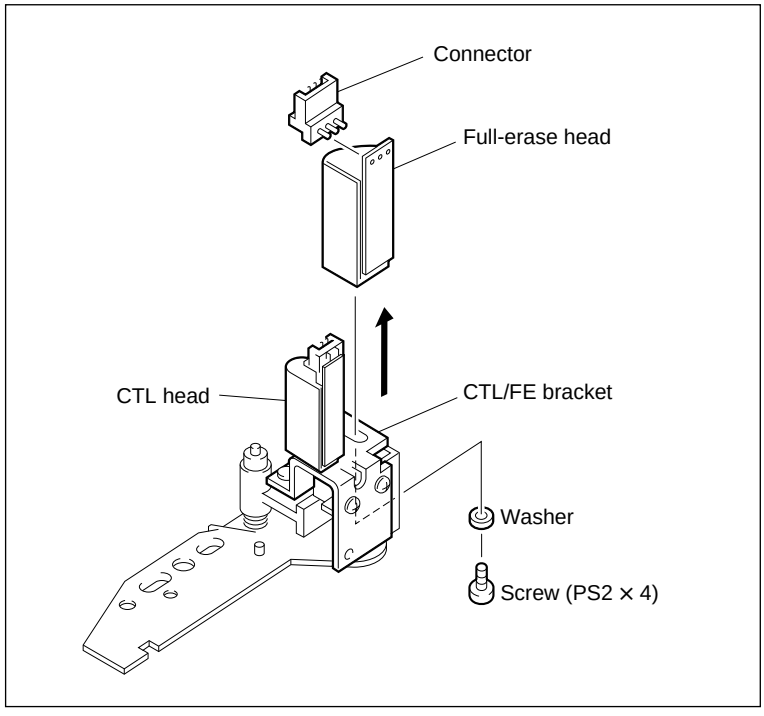
3. Remove the Full-erase Head

(1) Remove the screw and washer, then remove the full-erase head.

Notes

- Be careful not to damage the CTL head when the full-erase head is removed.
- Do not loosen or remove the two screws fixing the CTL/FE bracket. This causes the deviation in the zenith of the CTL head and full-erase head.

(2) Unsolder and remove the connector from the full-erase head's PC board.



Remove the Full-erase Head

Installation

4. Mount the Full-erase Head

(1) Solder the connector to the PC board of a new full-erase head.

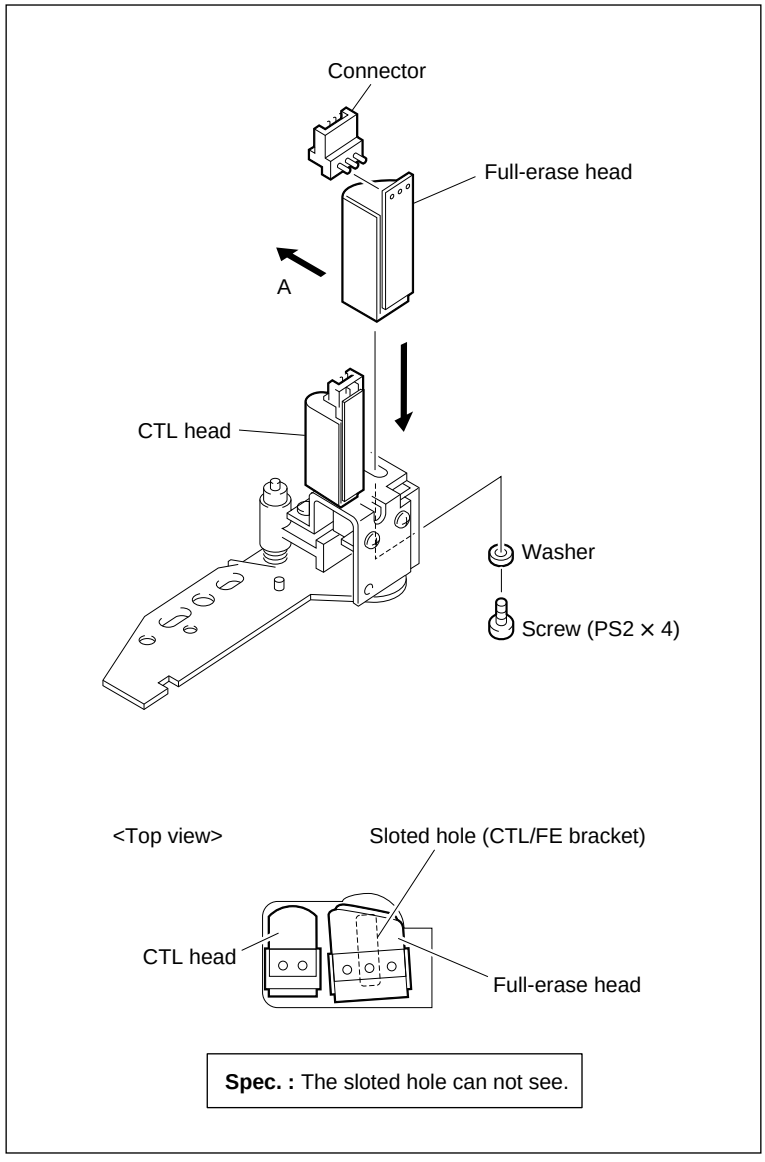
(2) Temporarily tighten the screw while moving the full-erase head in the direction indicated by arrow A.

Note

Be careful not to damage the full-erase head and CTL head.

(3) Confirm that the specification is satisfied, then tighten the screw.

Tightening torque: 19.6×10^{-2} N • m
{2.0 kgf • cm}



Mount the Full-erase Head

5. Attach the CTL/FE Head Assembly

(1) Confirm that the threading ring is in the unthreading end state.

(2) Put the sloted holes A and B of the CTL/FE head assembly into the bosses of the chassis.

Note

Be careful not to touch the drum (especially, video heads). Also, take care not to damage the peripheral tape guides.

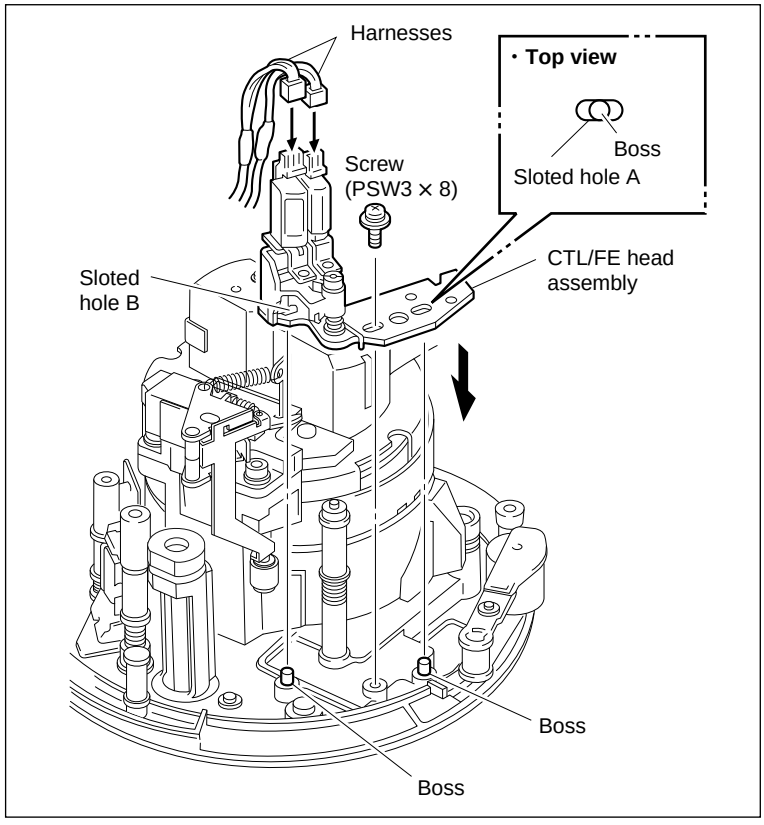
(3) Place the boss of the chassis in the center of the sloted hole A and tighten the screw.

6. Connect the Harnesses

Connect the two harnesses to the connectors of the CTL/FE head assembly.

7. Cleaning

Clean the tape-running surfaces of the CTL head and full-erase head using a cleaning cloth moistened with cleaning fluid.
(Refer to Section 2-2-5.)



Attach the CTL/FE Head Assembly

Adjustment after Replacement

8. Adjust the Tape Running

Refer to Section 6-1-2.

9. Confirm the CTL Head Height

Refer to Section 6-1-4.

10. Adjust the CTL Head Position

Refer to Section 6-1-5.

11. Confirm the Tape Running

Refer to Section 6-1-2.

12. Confirm the AT Head Position

Refer to Section 6-1-7.

13. Adjust the Drum Phase

Refer to Section 7-2-3.

14. Confirm the Full-erase Current

Refer to Section 4-11-4.

5-9. AT Head Replacement

Outline

Replacement

1. Remove the CL Guide Rail
2. Disconnect the Harness
3. Remove the AT Head Assembly
4. Remove the AT Head
5. Mount the AT Head
6. Attach the AT Head Assembly
7. Connect the Harness
8. Attach the CL Guide Rail
9. Cleaning (AT Head Surface)

Adjustment after Replacement

10. Adjust the AT Head Zenith (Refer to Section 6-1-1.)
11. Adjust the Tape Running (Refer to Section 6-1-2.)
12. Adjust the AT Head Height (Refer to Section 6-1-6.)
13. Adjust the AT Head Position (Refer to Section 6-1-7.)
14. Confirm the Audio Level in REV Mode (Refer to Section 6-1-8.)
15. Confirm the Video Tracking (Refer to Section 6-1-3.)
16. Confirm the Tape Running (Refer to Section 6-1-2.)
17. Perform the Electrical Adjustment after AT Head Replacement (Refer to Section 7-3.)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

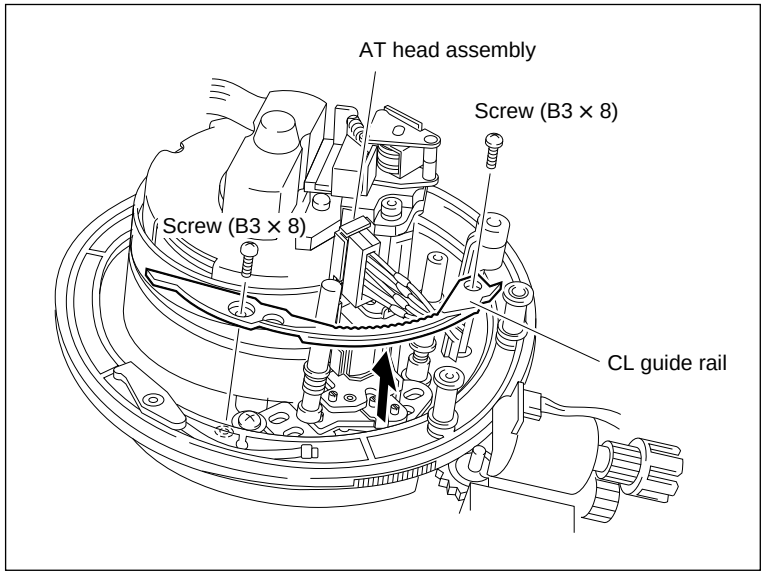
Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Torque screwdriver (6 kg•cm) (JB-5251): J-6252-510-A
- Torque screwdriver's bit (+2 mm, l = 75 mm): J-6323-420-A

Removal

1. Remove the CL Guide Rail

Remove the two screws, and remove the CL guide rail.



Remove the CL Guide Rail

2. Disconnect the Harness

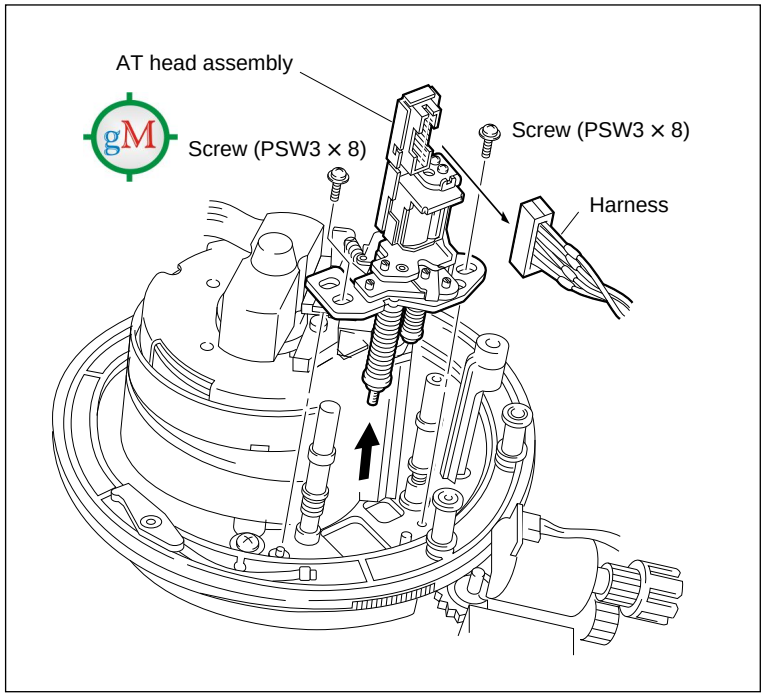
Disconnect the harness of the AT head assembly.

3. Remove the AT Head Assembly

Remove the two screws, then remove the AT head assembly from the unit.

Note

Be careful not to touch the drum (especially, video heads). Also, take care not to damage the peripheral tape guides.



Remove the AT Head Assembly

4. Remove the AT Head

(1) Remove the two screws, then remove the AT head and adjustment plate from the AT bracket.
(2) Remove the AT shield case.
(3) Remove the AT shield plate by opening the two claws using the long-nose plier.

Note

Never loosen or remove the azimuth adjustment screw.
If this screw is loosed or removed, the azimuth of the AT head will be out of specification.

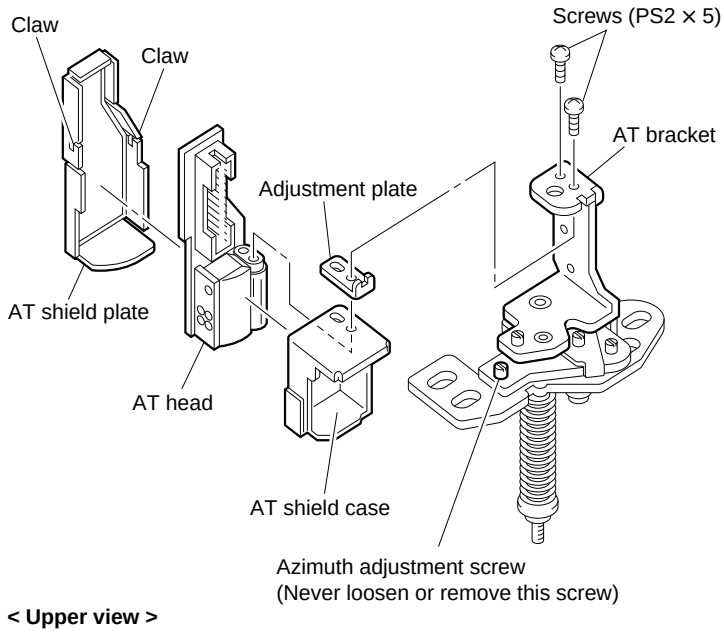
Installation

5. Mount the AT Head

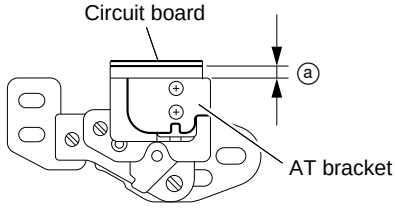
(1) Put a new head into the AT shield case and align the hole positions.
(2) Align the hole positions while putting the adjustment plate between the AT head and the AT bracket, then tentatively tighten the two screws.
(3) Tighten the screws after confirming that the specification is satisfied.

Tightening torque: 19.6×10^{-2} N • m
{2.0 kg • cm}

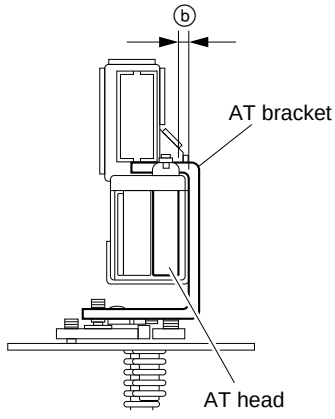
(4) Cover the AT shield plate on the AT head board.
Then, fix the AT shield plate by bending the two claws using the long-nose plier.



< Upper view >



< Front view >



Spec. :
ⓐ = (Upper view)
AT bracket is parallel to circuit board.
ⓑ = (Front view)
AT bracket is parallel to AT head.

Remove/Mount the AT Head

6. Attach the AT Head Assembly

(1) Put the two sloted holes of the AT head assembly into the two bosses of the chassis.

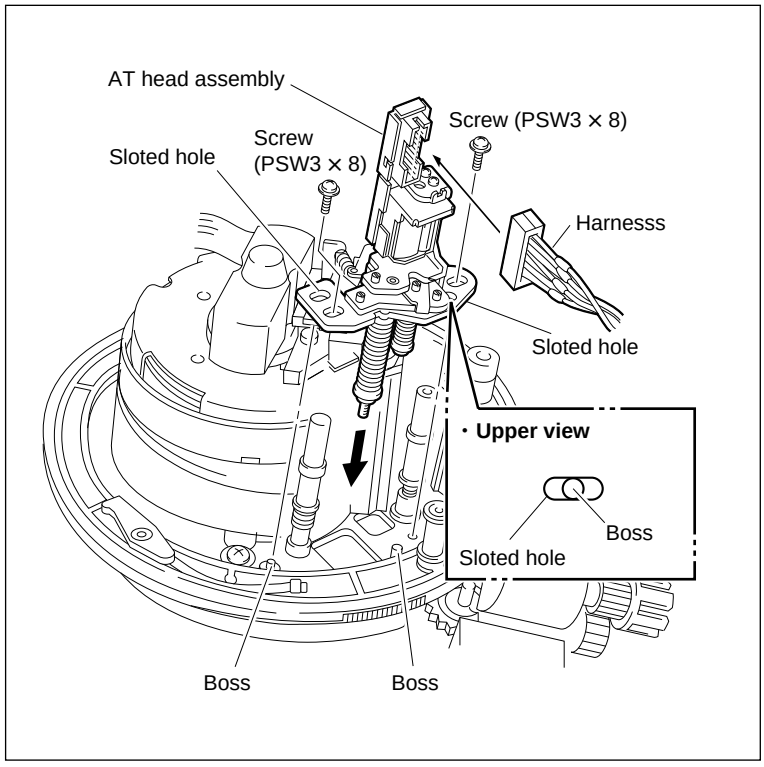
Notes

- Be careful not to touch the drum (especially, video heads). Also, take care not to damage the peripheral tape guides.
- Be careful not to damage the AT head surface.

(2) Place the bosses of the chassis in the center of the sloted holes and tighten the two screws.

7. Connect the Harness

Connect the harness to the connector of AT assembly.



Attach the AT Head Assembly

8. Attach the CL Guide Rail

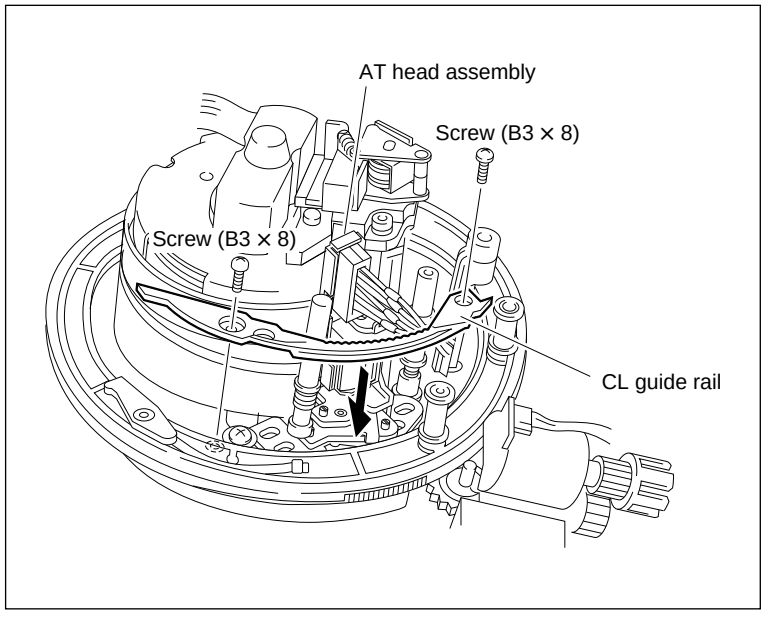
Attach the CL guide rail with the two screws.

9. Cleaning

Clean the tape-running surface of the AT head using a cleaning cloth moistened with cleaning fluid. (Refer to Section 2-2-5.)

Note

After cleaning, wipe using a dry cleaning cloth.



Attach the CL Guide Rail

Adjustment after Replacement

10. Adjust the AT Head Zenith
Refer to Section 6-1-1.

11. Adjust the Tape Running
Refer to Section 6-1-2.

12. Adjust the AT Head Height
Refer to Section 6-1-6.

13. Adjust the AT Head Position
Refer to Section 6-1-7.

14. Confirm the LTC Level in REV Mode
Refer to Section 6-1-8.

15. Confirm the Video Tracking
Refer to Section 6-1-3.

16. Confirm the Tape Running
Refer to Section 6-1-2.

17. Perform the Electrical Adjustment after AT Head Replacement
Refer to Section 7-3.

5-10. Pinch Roller Replacement

Replace the pinch roller every 2,000 hours of the tape-running.

Outline

Replacement

1. Remove the Pinch Arm Assembly
2. Attach the Pinch Arm Assembly
3. Adjust the Pinch Arm Assembly Vertical Play
4. Cleaning (Pinch Roller Surface)

Adjustment after Replacement

5. Confirm the Tape Running (Refer to Section 6-1-2.)
6. Confirm the AT Head Height (Refer to Section 6-1-6.)

Notes

1. When the pinch roller is damaged or worn, replace the pinch roller assembly.
2. When replacing the AT head cleaner, prepare a new stop washer.
   Stop washer (2.3) : 3-669-596-00

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

Tools

- Thickness gauge: 9-911-053-00
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

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Removal

1. Remove the Pinch Arm Assembly

(1) Remove the stop washer at the top of the pinch arm.

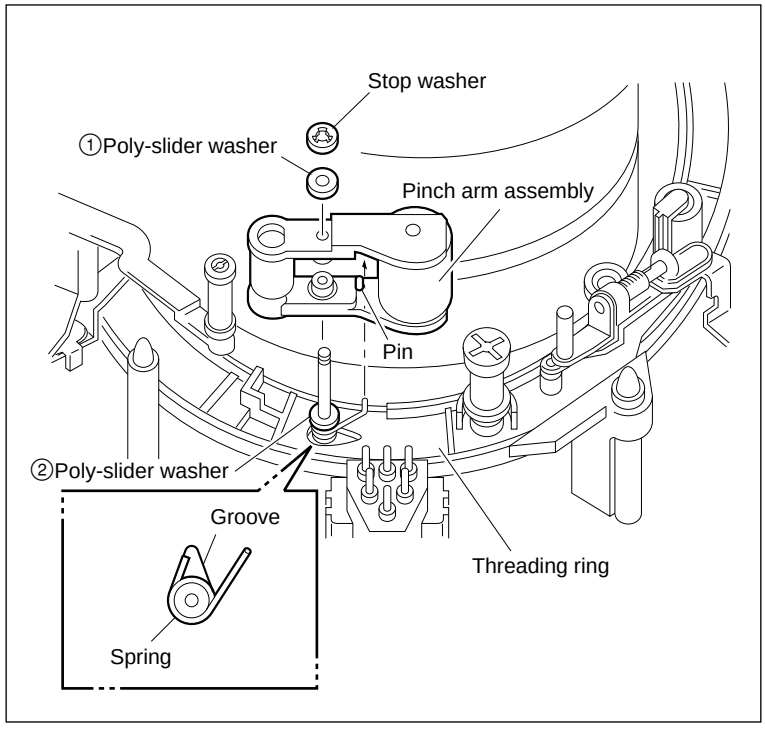
Note

If a poly-slider washer ① is inserted between the pinch arm assembly and the stop washer, be carefull not to lose the poly-slider washer. This poly-slider washer is used for vertical play adjustment.

(2) Remove the pinch arm assembly from the threading ring.

Note

Do not remove the poly-slider washer ② and spring at the bottom of the pinch arm assembly from the shaft.



Remove/Attach the Pinch Arm Assembly

Installation

2. Attach the Pinch Arm Assembly

(1) Pass a new pinch arm assembly through the shaft while hooking the spring as shown in the figure.

Notes

- Insert the short-end spring into the groove of the threading ring and hook the long-end spring to the side surface (drum side) of the pinch arm assembly.
- If the poly-slider washer ① was removed at the step 1, pass the same poly-slider washer through the shaft again.

(2) Fasten the pinch arm assembly by new stop washer.

Stop washer (2.3) : 3-669-596-00

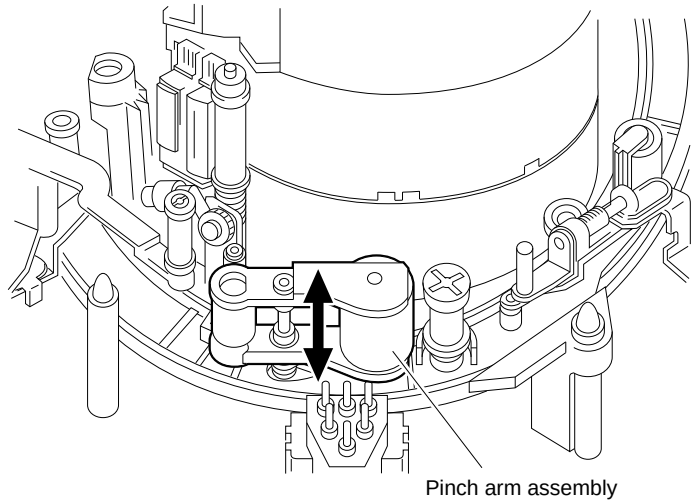
(3) Push the pinch arm assembly manually in the direction of the drum, then release. At that time, confirm that the pinch arm assembly smoothly returns to the former position.

3. Adjust the Pinch Arm Assembly Vertical Play

Move the pinch arm assembly in the vertical direction.
At this time, confirm that the vertical play satisfies the specification.

If the specification is not satisfied, perform the adjustment below.

(1) Remove the stop washer.
(2) Attach or remove the poly-slider washer at the upper of the pinch arm.
(3) Fasten the pinch arm assembly by new stop washer, confirm again that the specification is satisfied.



Spec. : Vertical play
0.05 mm to 0.2 mm

∗ When the specification is not satisfied.

・Poly-slider washer for adjustment

Diameter	Thickness	Part No.
3.0 mm	0.13 mm	3-701-439-01
	0.25 mm	3-701-439-11

Adjust the Pinch Arm Assembly Vertical Play

4. Cleaning

Clean the pinch roller's cylindrical surface using a cleaning cloth moistened with cleaning fluid. (Refer to Section 2-2-6.)

Adjustment after Replacement

5. Confirm the Tape Running

Refer to Section 6-1-2.

6. Confirm the AT Head Height

Refer to Section 6-1-6.

5-11. Pinch Solenoid Replacement

Replace the pinch solenoid earlier time either 6,000 hours of tape-running or 200,000 times of the threading.

5-11-1. Replacement Procedure of the Pinch Solenoid

Outline

Replacement

1. Disconnect the Harnesses (CN851 and CN854/PD-35 Board)
2. Remove the Pinch Press Assembly
3. Remove the PD-35 Board
4. Remove the Pinch Stopper
5. Remove the Pinch Solenoid
6. Attach the Pinch Solenoid
7. Attach the Pinch Stopper
8. Attach the PD-35 Board
9. Attach the Pinch Press Assembly
10. Connect the Harnesses (CN851 and CN854/PD-35 Board)

Adjustment after Replacement

11. Confirm the Pinch Solenoid Operation (Refer to Section 3-2-2.) (C020: PINCH ROLLER)
12. Adjust the Pinch Press Clearance (Refer to Section 5-11-2.)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

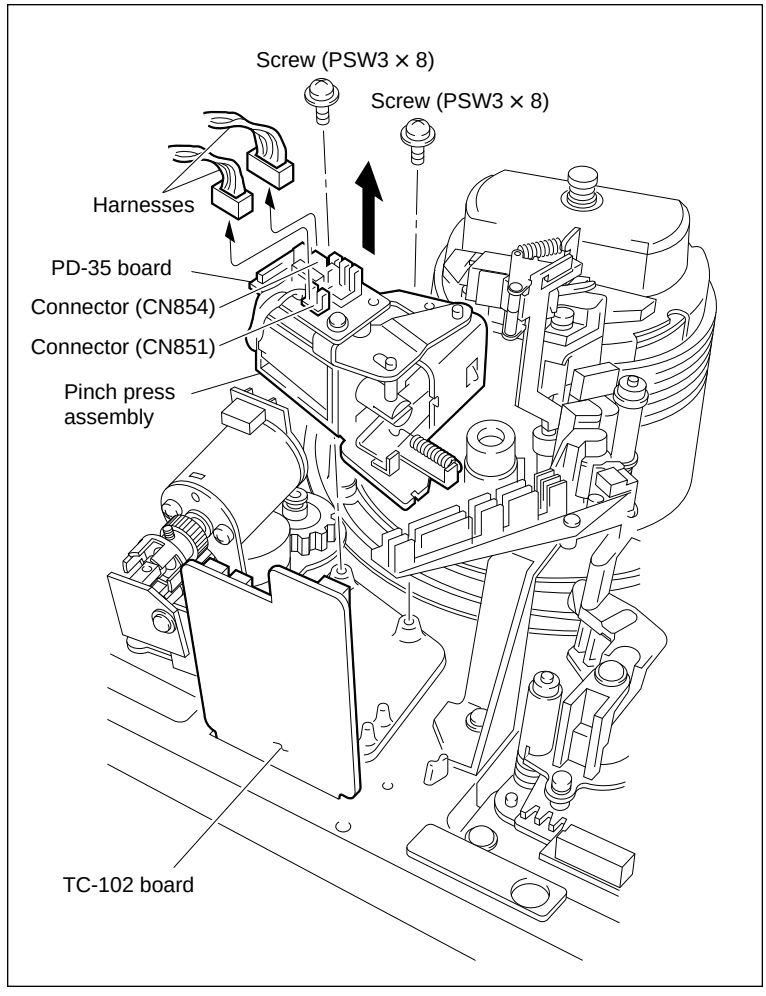
Removal

1. Disconnect the Harnesses

Disconnect the harnesses from the connectors CN851 and CN854 on the PD-35 board.

2. Remove the Pinch Press Assembly

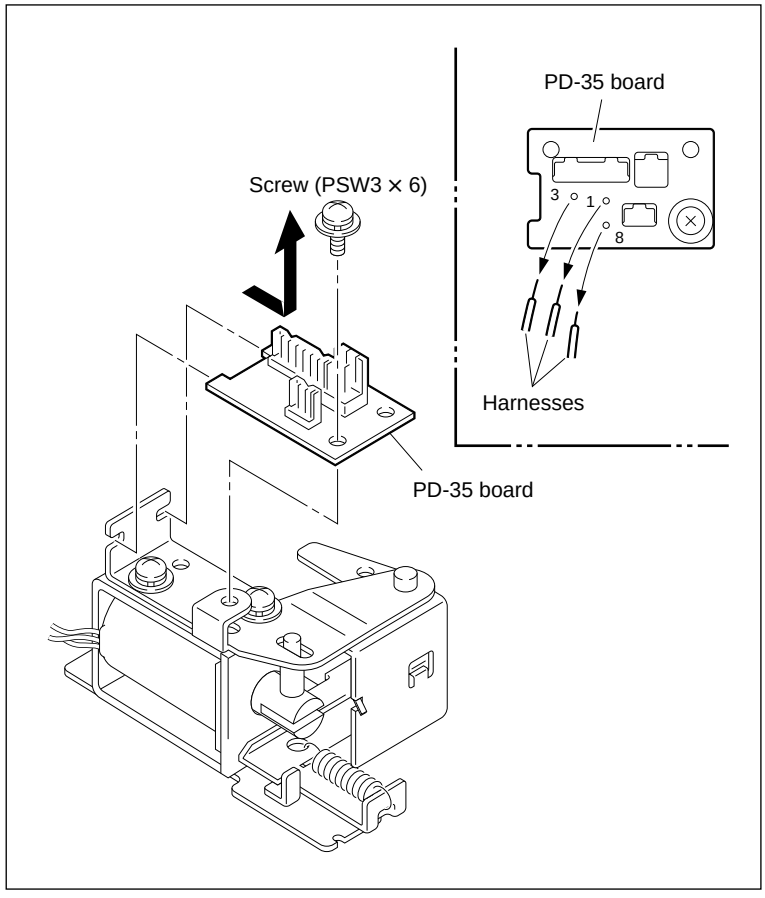
Remove the two screws, then remove the pinch press assembly from the unit.



Remove the Pinch Press Assembly

3. Remove the PD-35 Board

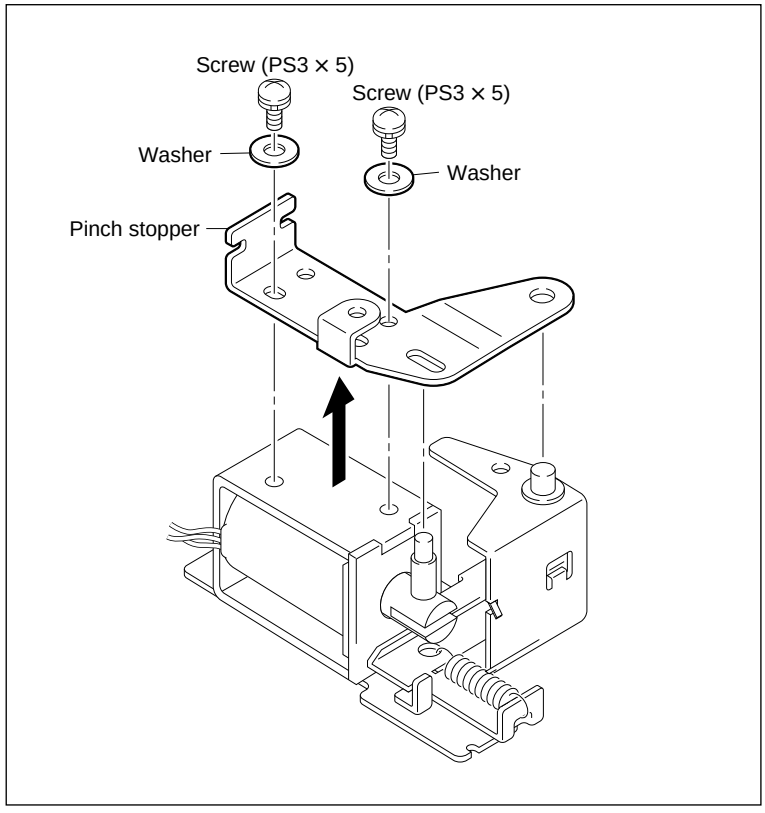
(1) Remove the screw, then remove the PD-35 board from the pinch press assembly.
(2) Unsolder the three harness soldered on the PD-35 board.



Remove the PD-35 Board

4. Remove the Pinch Stopper

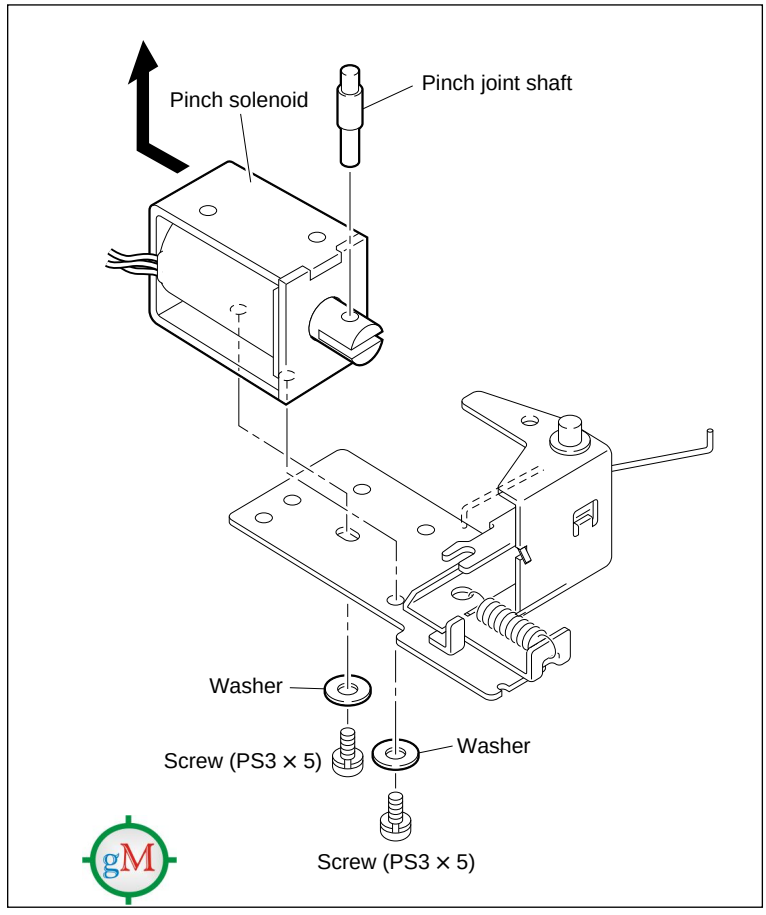
Remove the two screws and washers, then remove the pinch stopper.



Remove the Pinch Stopper

5. Remove the Pinch Solenoid

(1) Extract the pinch joint shaft.
(2) Remove the two screws and washers, then remove the pinch solenoid.



Remove the Pinch Solenoid

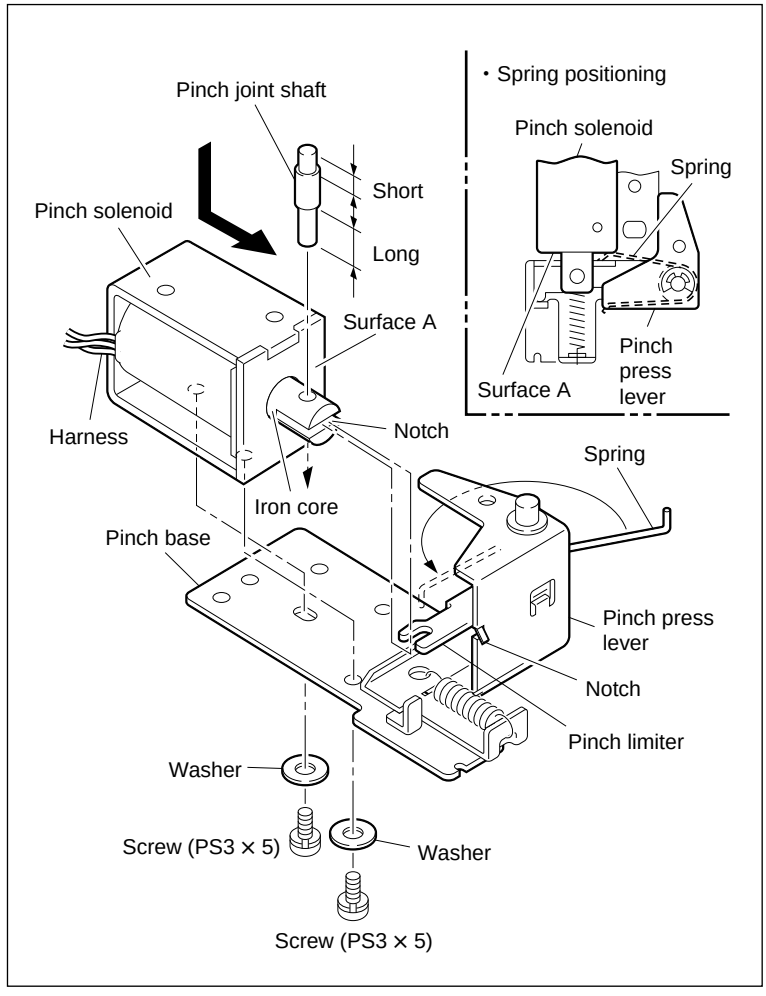
Installation

6. Attach the Pinch Solenoid

(1) Set a new solenoid to the pinch base in the direction shown in the figure.
(2) Bend the spring in the direction indicated by the arrow and bring it into contact with surface A of the solenoid shown in the figure.
(3) Put the pinch limiter into the notch of the solenoid's iron core and pass the pinch joint shaft through the hole of the iron core in the direction shown in the figure.
(4) Put the two washers and tighten the two screws.

Tightening torque: 98×10^{-2} N • m
{10.0 kgf • cm}

(5) Confirm that the other end of the spring is put on the notch of the pinch press lever.



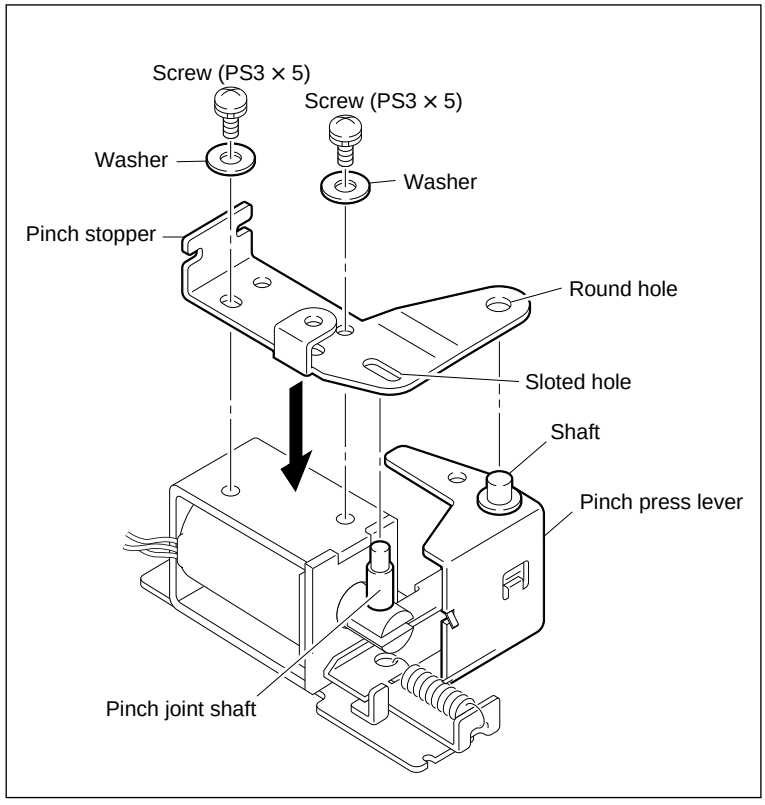
Attach the Pinch Solenoid

7. Attach the Pinch Stopper

(1) Pass the sloted hole of the pinch stopper to the pinch joint shaft, then pass the round hole to the shaft of the pinch press lever.

(2) Put the washers and tighten the screws.

Tightening torque: 98×10^{-2} N • m
{10.0 kgf • cm}

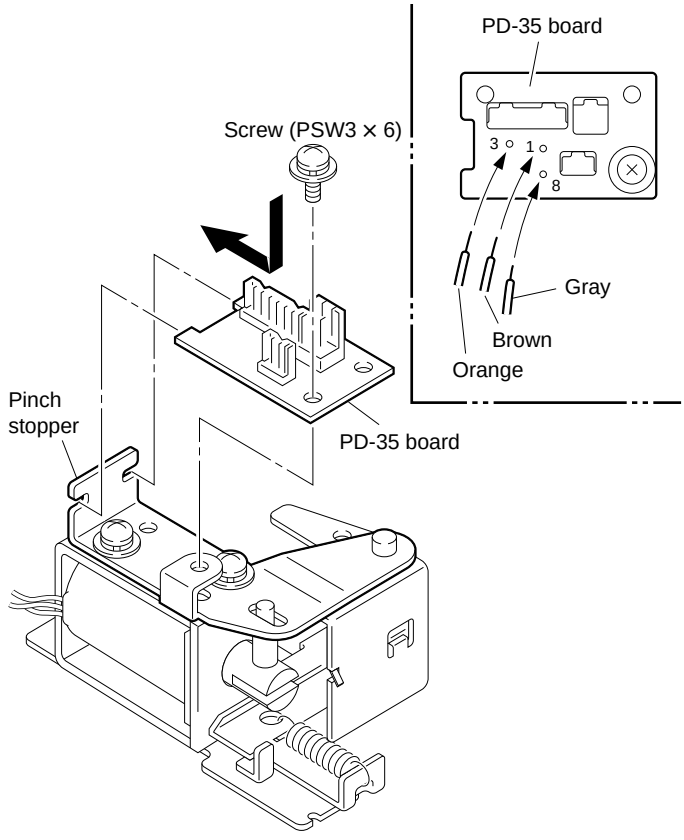


Attach the Pinch Stopper

8. Attach the PD-35 Board

(1) Solder the three wire of the harness to the PD-35 board as shown in the figure, then solder.

(2) Insert the PD-35 board into the pinch stopper and tighten the screw.



・Harness wiring

Print on board	Harness
1	Brown
3	Orange
8	Gray

Attach the PD-35 Board

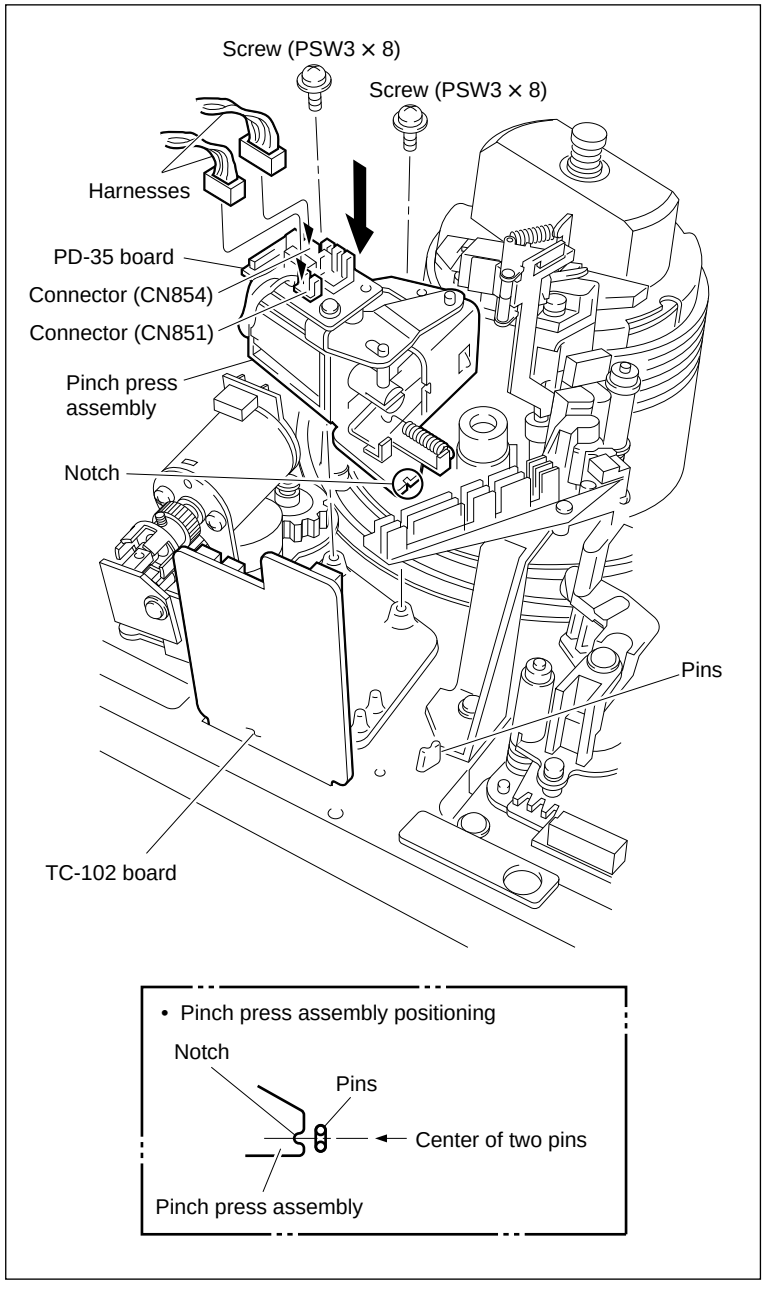
9. Attach the Pinch Press Assembly

Align the notch of the pinch press assembly with the center of the two pins and tighten the two screws.

Tightening torque: 98×10^{-2} N • m
{10.0 kgf • cm}

10. Connect the Harnesses

Connect the harnesses to the connectors CN851 and CN854 on the PD-35 board.



Attach the Pinch Press Assembly

Adjustment after Replacement

11. Confirm the Pinch Solenoid Operation

Refer to Section 3-2-2.
(C020: PINCH ROLLER)

12. Adjust the Pinch Press Clearance

Refer to Section 5-11-2.

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5-11-2. Pinch Press Clearance Adjustment

Note

- Be sure to check the clearance at pinch press is energized state when the pinch press assembly is removed.

Tool

- Wire clearance check gauge set: J-6152-450-A

Check

1. Put the Pinch Solenoid into the Energized State

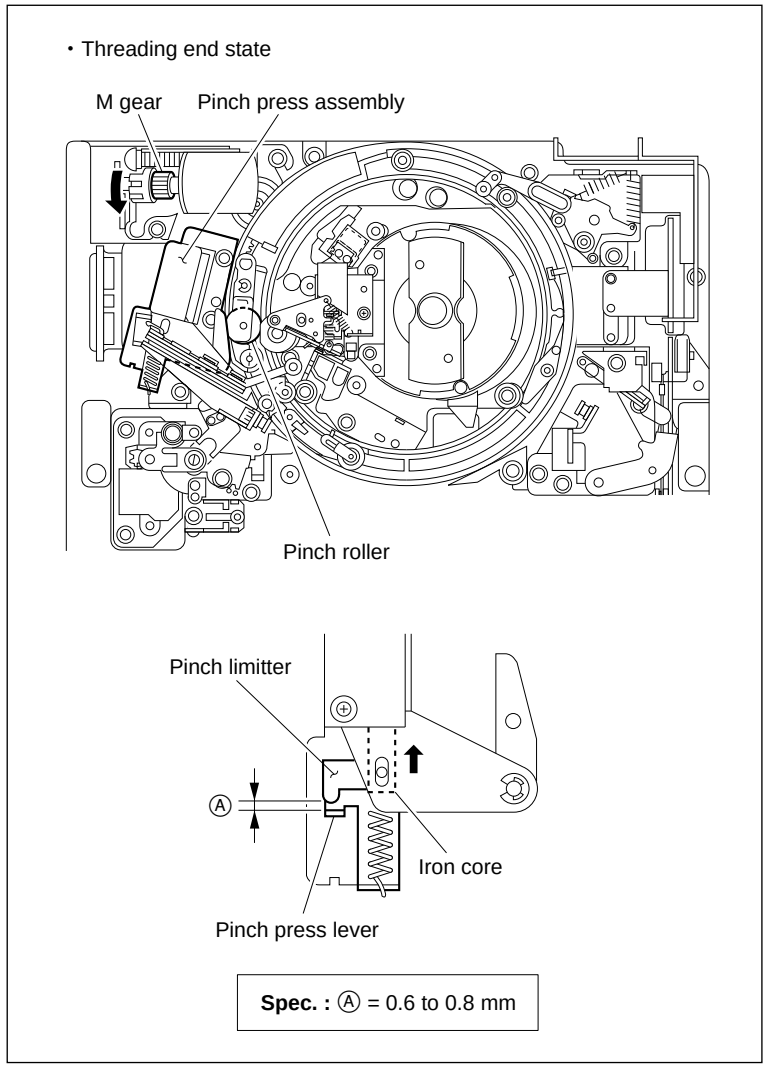
(1) Turn the M gear of the gear box assembly manually, and put the unit into the threading end mode.

(2) Press the iron core of the pinch solenoid in the direction of the fully energized state.

2. Check the Pinch Press Clearance

Check that the clearance between the pinch limiter and pinch press lever satisfies the specification.

If the specification is not satisfied, perform steps 3 and later.



Pinch Press Clearance Check

Adjustment

3. Loosen the Screws

Loosen the two screws securing the pinch press assembly by 1/2 to one turn.

4. Adjust the Pinch Press Assembly Position

Put the pinch solenoid into the energized state, then insert the tip of a 3 mm flat-blade screwdriver into the notch of the pinch press assembly and adjust the pinch press assembly position so that the specification is satisfied.

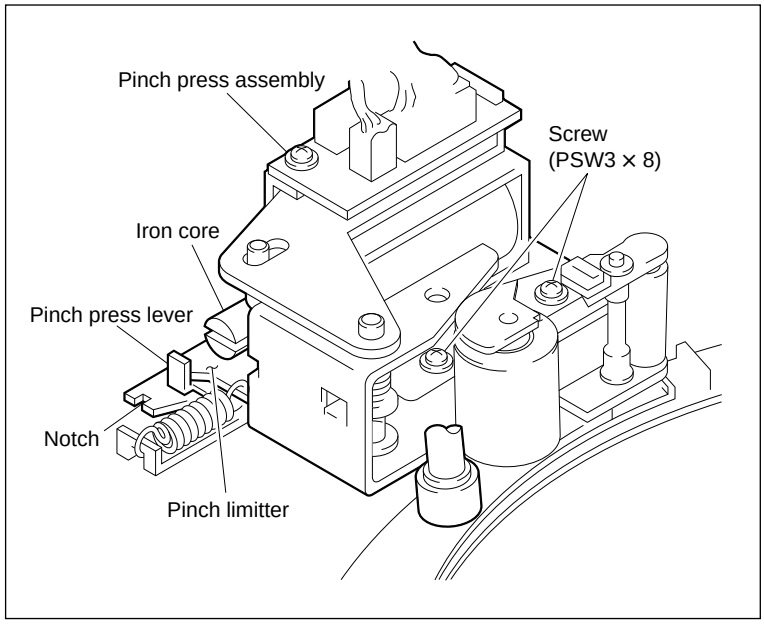
5. Tighten the Screws

Tighten the two screws loosened in step 3.

Tightening torque: 98×10^{-2} N • m
{10.0 kgf • cm}

6. Recheck the Pinch Press Clearance

Refer to steps 1 and 2.



Adjust the Pinch Press Clearance

5-12. Capstan Motor Replacement

Replace the capstan motor every 6,000 hours of tape-running.

Outline

Replacement

1. Remove the Bottom Plate
2. Remove the Shield Plate (Bottom)
3. Remove the DR-315 Board
4. Remove the Video Head Cleaner Assembly
5. Remove the Capstan Motor
6. Attach the Capstan Motor
7. Attach the DR-315 Board
8. Attach the Shield Plate (Bottom)
9. Attach the Bottom Plate
10. Attach the Video Head Cleaner Assembly
11. Cleaning (Capstan Motor Shaft)

Adjustment after Replacement

12. Confirm the Pinch Press Clearance (Refer to Section 5-11-2.)
13. Confirm the Tape Running (Refer to Section 6-1-2.)
14. Confirm the Capstan Motor Operation (Refer to Section 3-2-2.)
    (C014: CAPSTAN MOTOR)
15. Perform the Capstan FG Duty Adjustment (Refer to Section 3-2-5.)
    (A003: CAPSTAN FG DUTY)
16. Perform the Capstan Free Speed Adjustment (Refer to Section 3-2-5.)
    (A010: CAPSTAN FREE SPEED)
17. Perform the Adjusted Data Save (Refer to Section 3-2-5.)
    (A012: NV-RAM CONTROL)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4-2.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

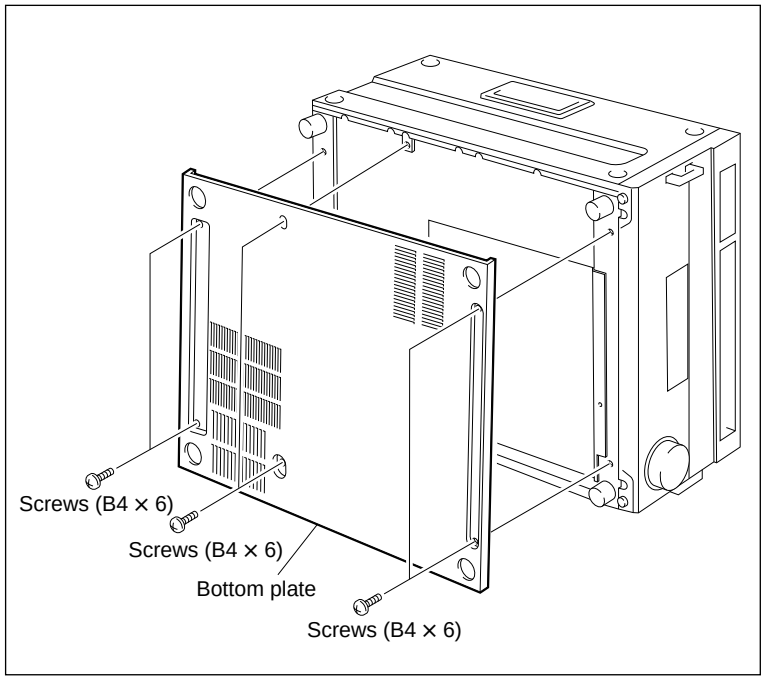
Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- L shaped hex. wrench (d = 2.5 mm): 7-700-736-04

Removal

1. Remove the Bottom Plate

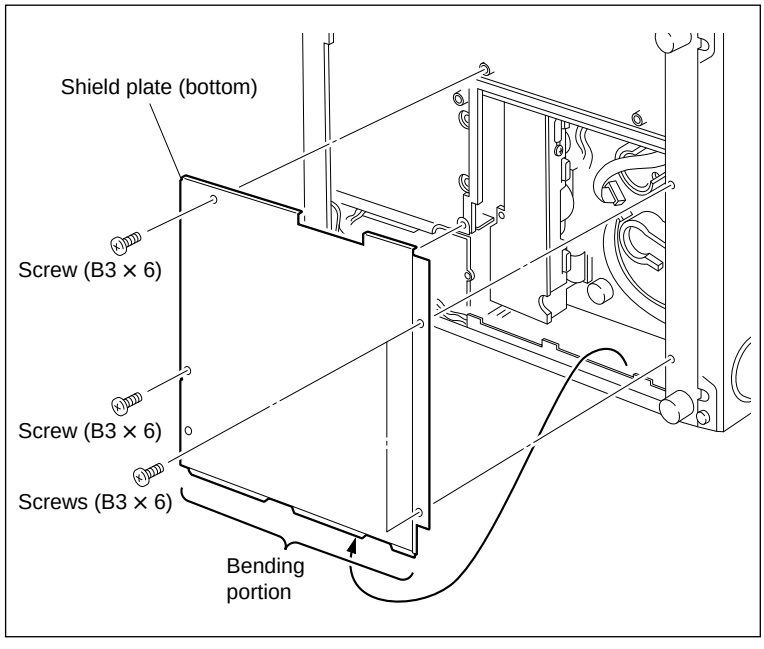
(1) Place the unit on its right side panel down.
(2) Remove the six screws and remove the bottom plate.



Remove the Bottom Plate

2. Remove the Shield Plate (Bottom)

Remove the four screws, and then remove the shield plate (bottom).



Remove the Shield Plate (Bottom)

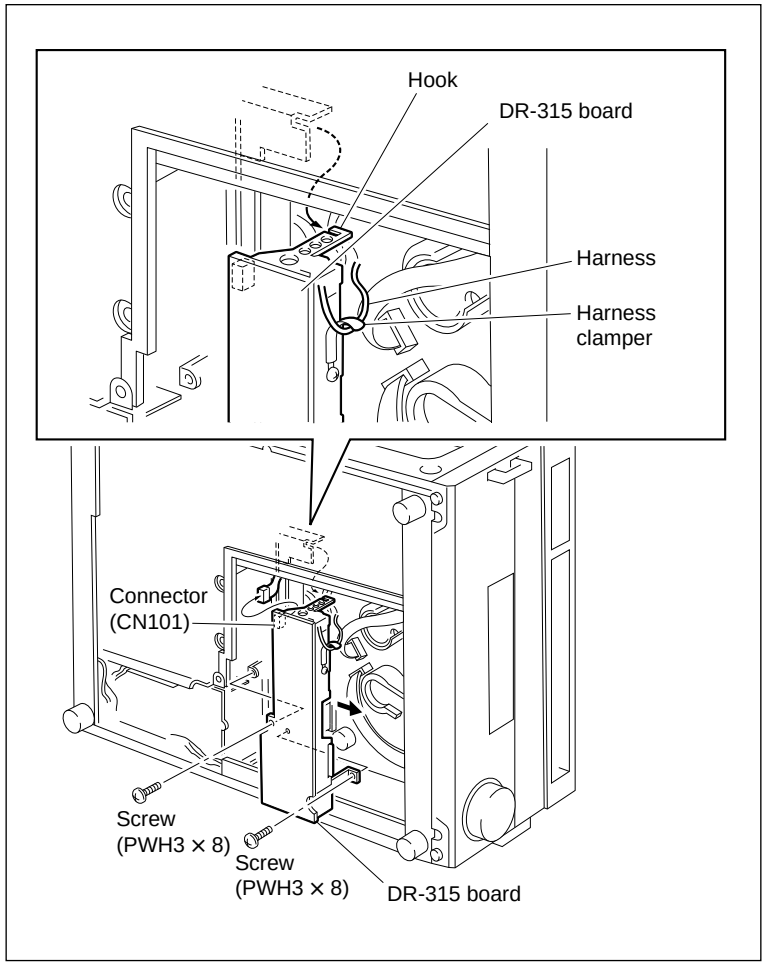
3. Remove the DR-315 Board

(1) Stretch the harness clamper on the DR-315 board and release the bundled harness.
(2) Remove the two screws shown in the figure.
(3) Move the DR-315 board toward the reel motors by about 1 cm, and detach the hook.

Note

The hook is difficult to view because it is located in the inner part.

(4) Disconnect the harness from connector CN101 on the DR-315 board.
(5) Move the DR-315 board in the direction indicated by the arrow until the capstan motor is viewed.



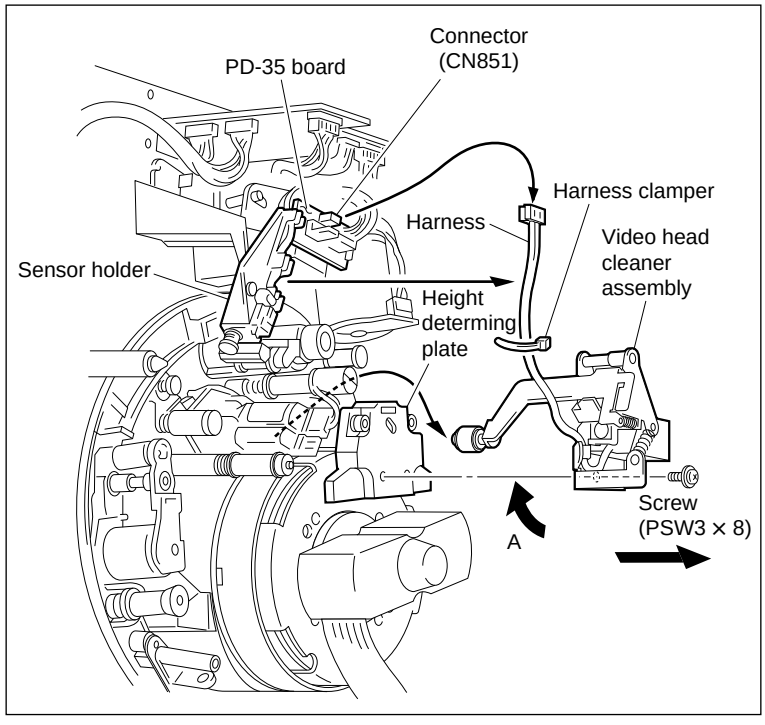
Remove the DR-315 Board

4. Remove the Video Head Cleaner Assembly

(1) Disconnect the harness from connector CN851 on the PD-35 board.
(2) Cut the harness clamper.
(3) Remove the harness from the sensor holder.
(4) Remove the screw, shift the video head cleaner assembly in the direction indicated by the arrow A, and remove it from the height determing plate.

Note

To remove the securing screws of the capstan motor, remove the video head cleaner assembly.



Remove the Video Head Cleaner Assembly

5. Remove the Capstan Motor

(1) Disconnect the harness from connector on the capstan motor's PC board.

(2) Remove the two screws while holding the capstan motor by hand.

Note

Be carefull not to fall the removed screw in the unit.

Installation

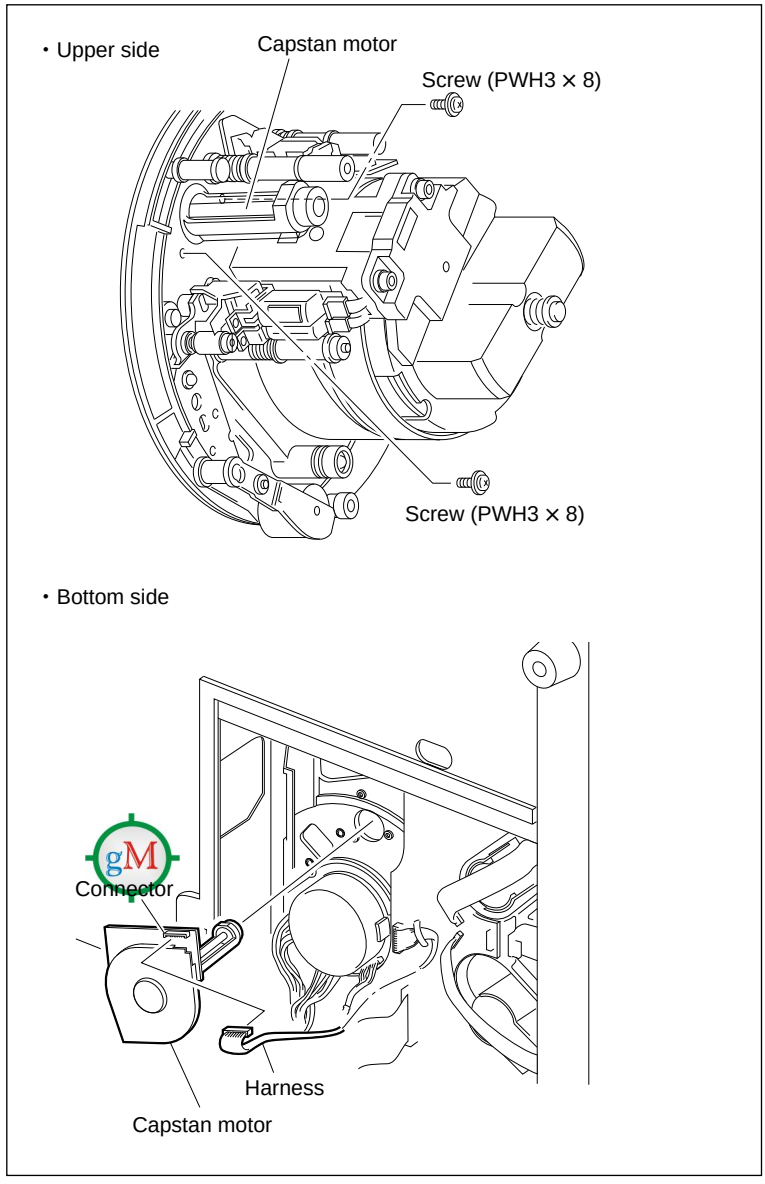
6. Attach the Capstan Motor

(1) Pass a new capstan motor through the hole of the chassis in the direction shown in the figure and tighten the two screws.

Notes

- Be careful not to drop the capstan motor.
- Be careful not to damage the capstan motor shaft when passing the capstan motor through the hole of the chassis.

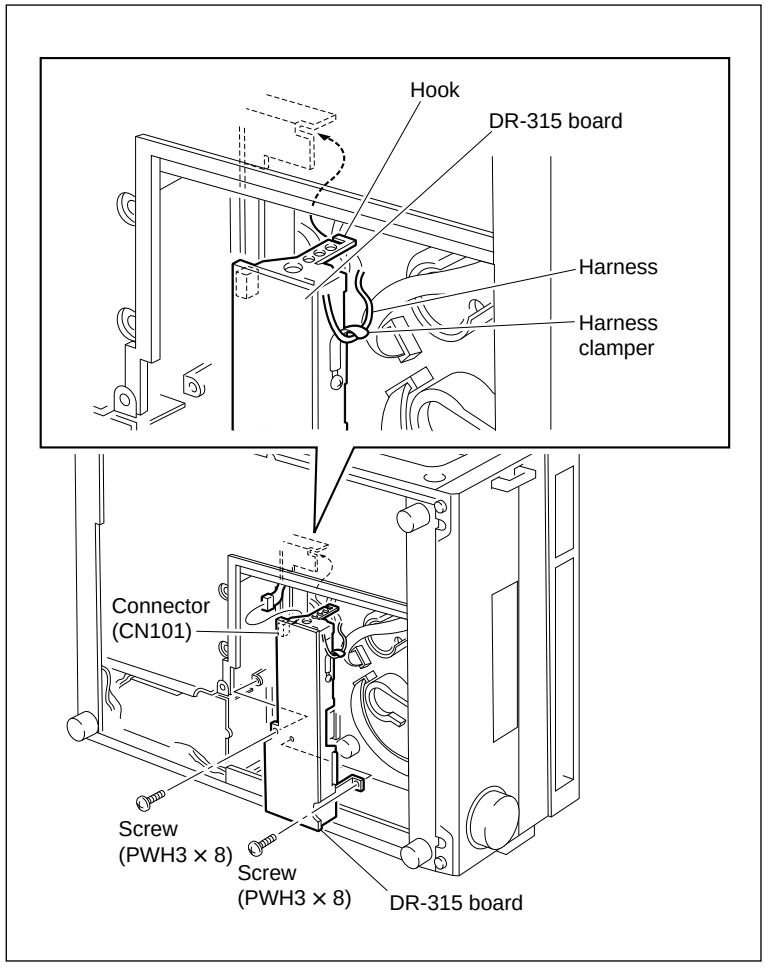
(2) Connect the harness disconnected in (1) of step 5 to the capstan motor.



Remove/Attach the Capstan Motor

7. Attach the DR-315 Board

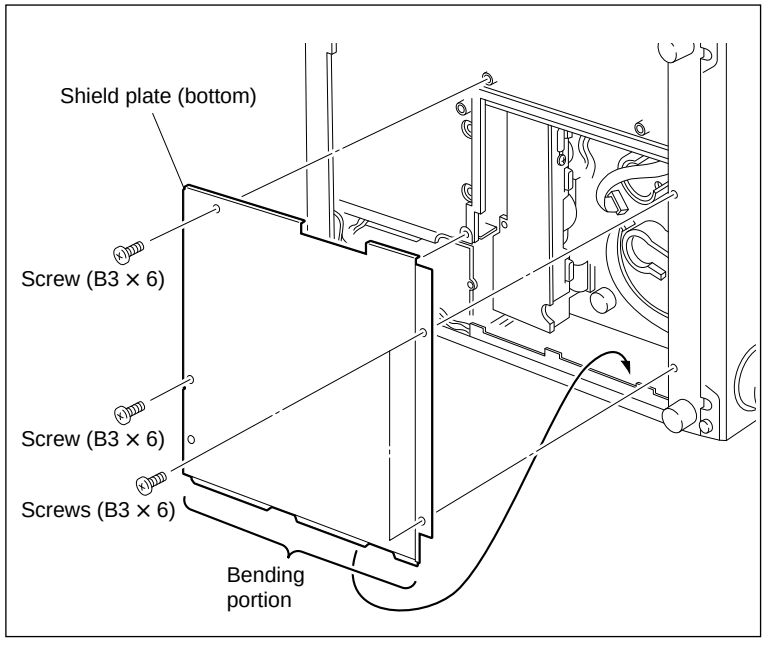
(1) Connect the harness to the connector CN101 on the DR-315 board.
(2) Put the hook on the DR-315 board into the groove of the chassis.
(3) Fix the DR-315 board with two screws.
(4) Fix the harness released in (1) of step 3 with the harness clamper.



Attach the DR-315 Board

8. Attach the Shield Plate (Bottom)

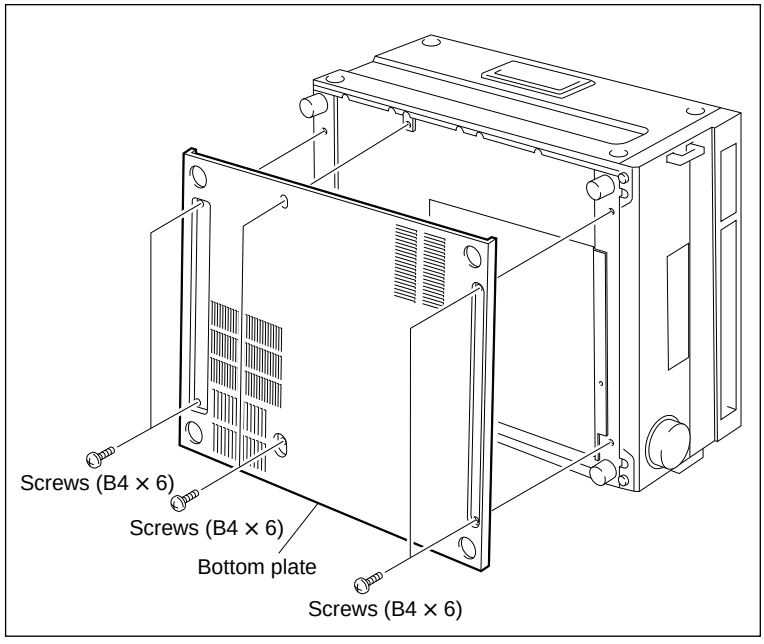
Attach the shield plate (bottom) with four screws.



Attach the Shield Plate (Bottom)

9. Attach the Bottom Plate

Attach the bottom plate with six screws.



Attach the Bottom Plate

10. Attach the Video Head Cleaner Assembly

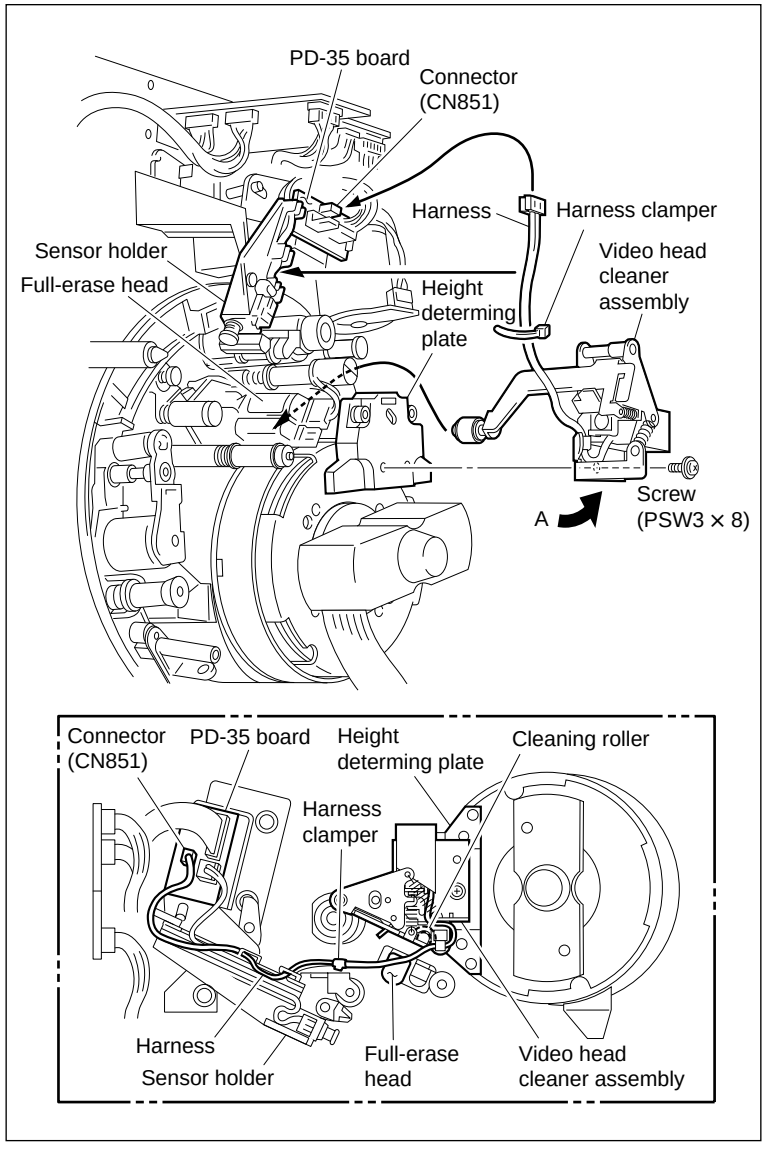
(1) Insert the cleaning roller into the clearance between the height determing plate and full-erase head as shown in the figure.
(2) Adjust the position of the two pins of the video head cleaner assembly with the two holes of the height determing plate.
(3) Tighten the screw while pushing the video head cleaner assembly in the direction indicated by the arrow A.
(4) Fix the harness to the position on the sensor holder as shown in the figure.
(5) Connect the harness to connector CN851 on the PD-35 board.
(6) Bind the two harnesses of the full-erase head and the video head cleaner assembly with a new harness clamper (or the equivalent).
(7) Adjust the position of the cleaning roller. (Refer to step 5 in Section 5-5.)

11. Cleaning

Clean the capstan motor shaft using a cleaning cloth moistened with cleaning fluid.

CAUTION

After cleaning, wipe using a dry cleaning cloth.



Attach the Video Head Cleaner Assembly

Adjustment after Replacement

12. Confirm the Pinch Press Clearance

Refer to Section 5-11-2.

13. Confirm the Tape Running

Refer to Section 6-1-2.

14. Confirm the Capstan Motor Operation

Refer to Section 3-2-2.
(C014: CAPSTAN MOTOR)

15. Perform the Capstan FG Duty Adjustment

Refer to Section 3-2-5.
(A003: CAPSTAN FG DUTY)

16. Perform the Capstan Free Speed Adjustment

Refer to Section 3-2-5.
(A010: CAPSTAN FREE SPEED)

17. Perform the Adjusted Data Save

Refer to Section 3-2-5.
(A012: NV-RAM CONTROL)

5-13. Reel Table Assembly Replacement

Outline

Replacement

1. Remove the Reel Table Assembly
2. Attach the Reel Table Assembly

Adjustment after replacement

3. Confirm the Reel Table Height (Refer to Section 5-13-1.)
4. Confirm the Reel Brake Clearance (Refer to Section 5-13-2.)
5. Confirm the Reel Brake Release Amount (Refer to Section 5-13-3.)
6. Confirm the Reel Rotation Sensor Position (Refer to Section 5-13-4.)
7. Perform the Reel FG Duty Adjustment (Refer to Section 3-2-5.)
   (A001: S REEL FG DUTY, A002: T REEL FG DUTY)
8. Perform the Adjusted Data Save (Refer to Section 3-2-5.)
   (A012: NV-RAM CONTROL)

Note

The reel table assembly replacement is the same on the supply (S) and take-up (T) sides.

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment assembly. (Refer to Section 1-5.)

Tools

- L wrench (Across flat has 1.5 mm): 7-700-736-05
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

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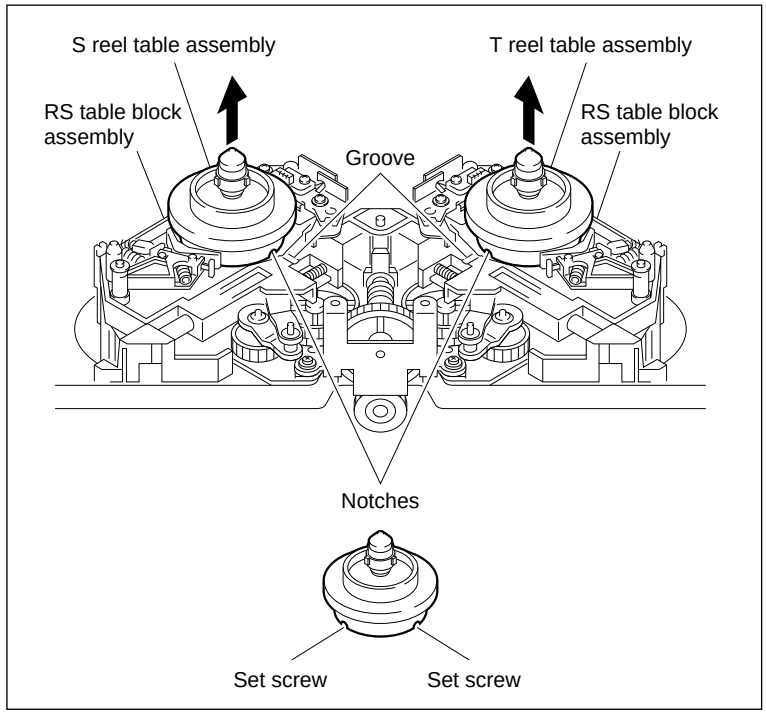
Removal

1. Remove the Reel Table Assembly

(1) Align one of the two notches at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(2) Insert the L wrench into the notch at the bottom of the reel table assembly along the groove of the RS table block assembly.
(3) Turn the set screw counterclockwise by 1/2 to one turn, then loosen.
(4) Align the other notch at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(5) Loosen the other set screw in the same way as in step (2).
(6) Remove the reel table assembly.

Note

A polywasher may be attached together when the reel table assembly is removed. In this case, remove the polywasher from the reel table assembly and return it to the reel motor shaft. The polywasher is used for reel table height adjustment.



Remove the Reel Table Assembly

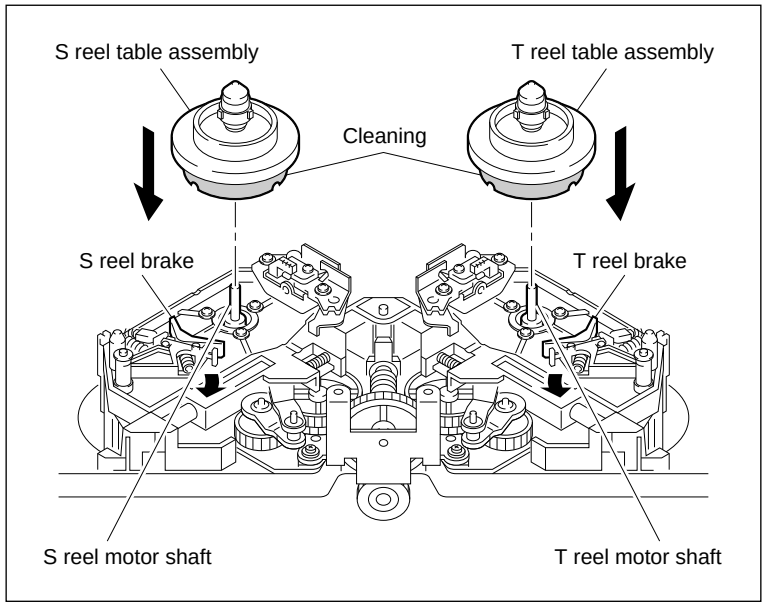
Installation

2. Attach the Reel Table Assembly

(1) Clean the circumference of a new reel table assembly.
(2) Push the reel brake in the direction indicated by the arrow to make free, and pass the reel table assembly through the reel motor shaft.

Note

Tighten the two set screws of the reel table assembly after the reel table height confirmation is completed.



Attach the Reel Table Assembly

Adjustment after Replacement

3. Confirm the Reel Table Height

Refer to Section 5-13-1.

4. Confirm the Reel Brake Clearance

Refer to Section 5-13-2.

5. Confirm the Reel Brake Release Amount

Refer to Section 5-13-3.

6. Confirm the Reel Rotation Sensor Position

Refer to Section 5-13-4.

7. Perform the Reel FG Duty Adjustment

Refer to Section 3-2-5.
(A001: S REEL FG DUTY,
A002: T REEL FG DUTY)

8. Perform the Adjusted Data Save

Refer to Section 3-2-5.
(A012: NV-RAM CONTROL)

5-13-1. Reel Table Height Adjustment

Notes

- Be sure to check the height of the reel table when a reel table is removed or when it is replaced.
- Perform the reel table height adjustment correctly.
  The height of the reel table is used as the reference for the tape path.
- After the supply reel table height adjustment is performed, be sure to check the video tracking. (Refer to Section 6-1-3.)

Tools

- Cassette reference plate (L) (MW-088): J-6320-880-A
- Reel table height gauge (MW-935): J-6329-350-A
- L-shaped wrench (1.5 mm): 7-700-736-05

Check

1. Set the Cassette Reference Plate (L)

Place the cassette reference plate (L) in the direction shown in the figure, then place it on two cassette supports.

2. Place the RS Table Block Assembly in the L Cassette Position

Rotate the drive gear counterclockwise as far as it will go.

3. Check the Take-up Reel Table Height

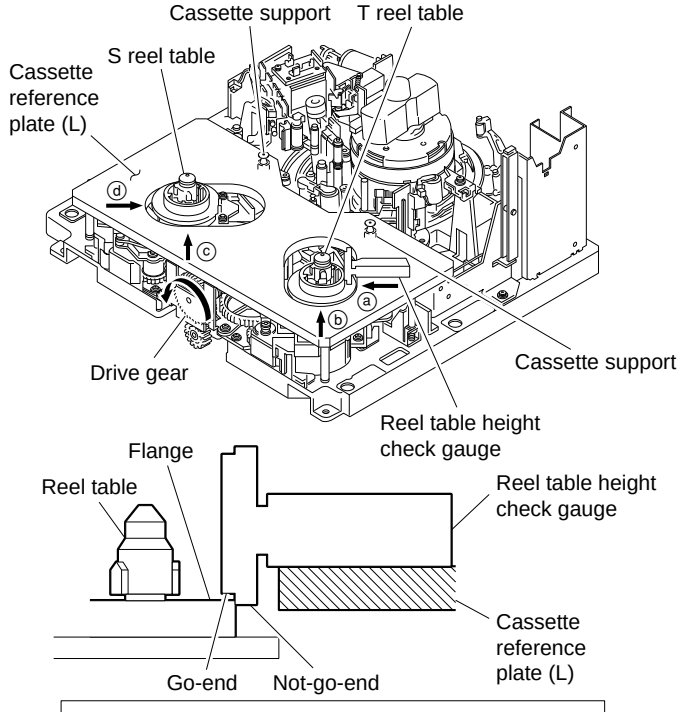
(1) Press the "T"-stamped side of the gauge against the take-up reel table from the direction indicated by the arrow ⓐ.
(2) Check that the specification is satisfied while rotating the take-up reel table clockwise by one turn.
(3) Check the reel table height from the directions indicated by the arrow ⓑ in the same way.

4. Check the Supply Reel Table Height

(1) Press the "S"-stamped side of the gauge against the supply reel table from the direction indicated by the arrow ⓒ.
(2) Check that the specification is satisfied while rotating the supply reel table counter-clockwise by one turn.
(3) Check the reel table height from the directions indicated by the arrow ⓓ in the same way.

If the specification is not satisfied in steps 3 and 4, perform steps 7 and 8.

< L cassette position >



Spec. : The go-end of the gauge slide over the flange of the reel table.
The not-go-end of the gauge does not slide over.

Check the Reel Table Height (L)

5. Place the Reel Shift Plate Assembly in the S Cassette Position

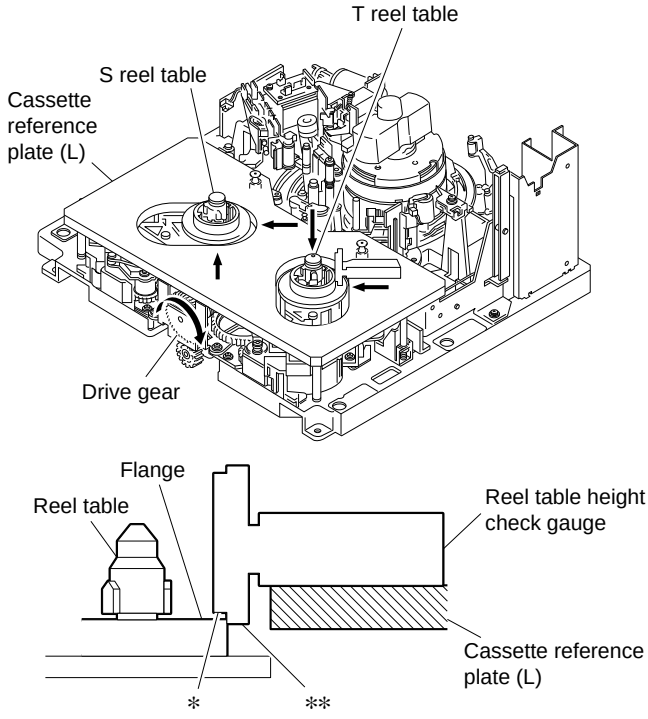
Rotate the drive gear clockwise as far as it will go.

6. Check the Supply and Take-up Reel Table Height

Perform in the same way as in steps 3 and 4.

If the specification is not satisfied, perform steps 7 and later.
If the specifications are satisfied in both the L and S cassette positions, perform steps 9 and later.

< S cassette position >



Spec. : The * marked portion of the gauge slide over the flange of the reel table.
The ** marked portion of the gauge does not slide over.

Check the Reel Table Height (S)

Adjustment

7. Remove the Reel Table

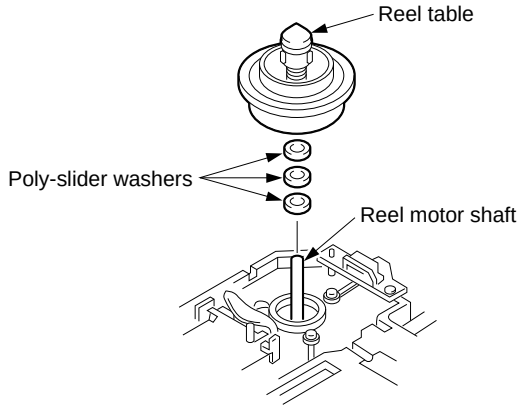
Refer to step 1 in Section 5-13.

8. Adjust the Number of Poly-slider Washers

Adjust the number of poly-slider washers installed in the reel motor shaft so that the specifications are satisfied in both the L and S cassette positions.

9. Remove the Cassette Reference Plate (L)

Remove the cassette reference plate (L) and reel table height gauge.



• Poly-slider washer for adjustment

Diameter	Thickness	Part No.
4 mm	0.05 mm	3-188-108-01
	0.13 mm	3-701-441-01
	0.25 mm	3-701-441-11
	0.5 mm	3-701-441-21

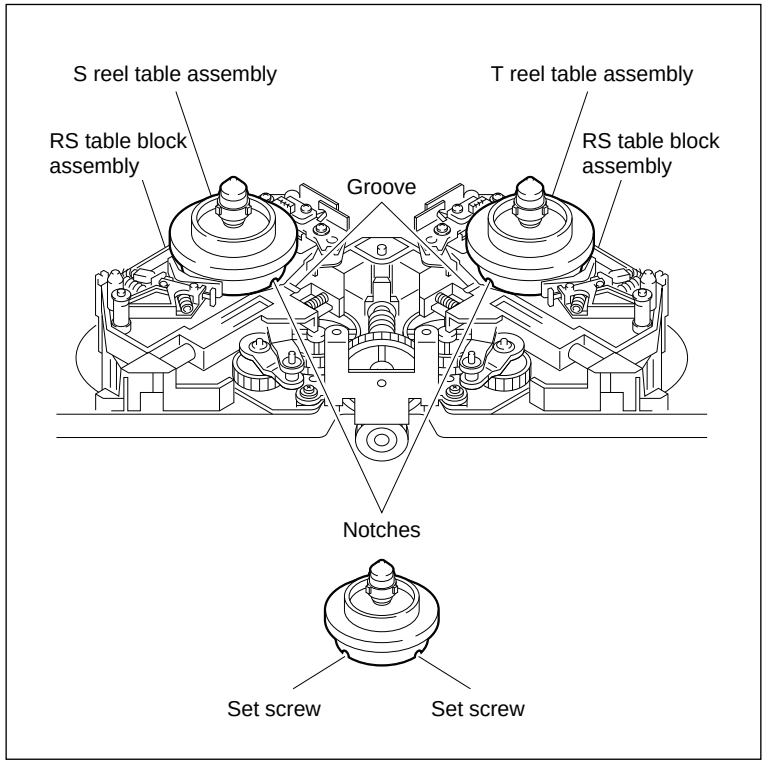
Remove the Reel Table

10. Tighten the Screws of the Reel Table Assembly

(1) Align the notch at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(2) Insert an L-shaped wrench into the notch at the bottom of the reel table assembly along the groove of the RS table block assembly and tighten the two set screws.

11. Recheck the Reel Table Height

Refer to steps 2 through 6.



Tighten the Screws of the Reel Table Assembly

5-13-2. Reel Brake Clearance Check

Note

- Be sure to check clearance of the reel brake when the reel table assembly is removed or when it is replaced.

Check

1. Check the Take-up Reel Brake Clearance

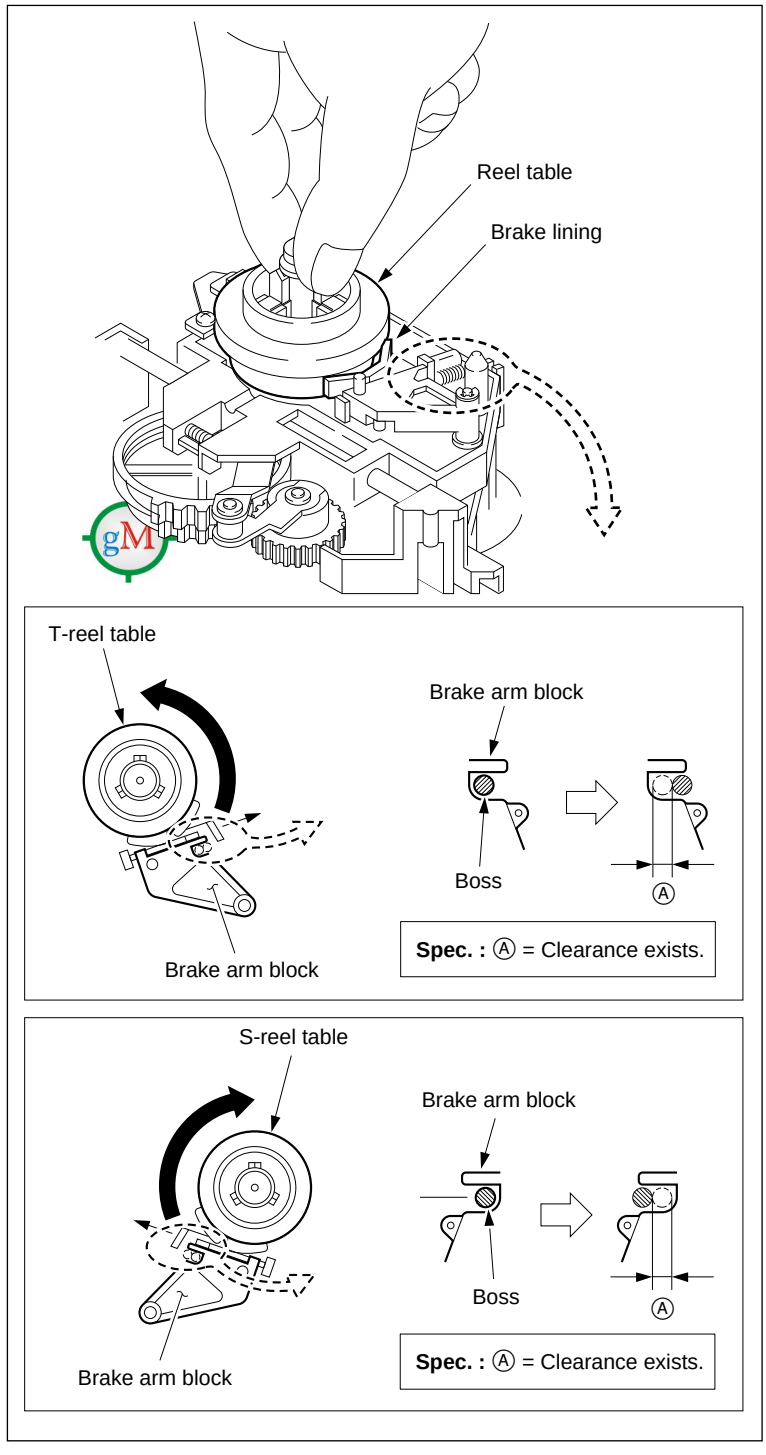
Rotate the take-up reel table counterclockwise by fingers.
At that time, check that a clearance occurs between the brake arm block and boss.

If no clearance occurs, replace the brake lining.
Brake Lining Replacement : Section 5-14.

2. Check the Supply Reel Brake Clearance

Rotate the supply reel table clockwise by fingers.
At that time, check that a clearance occurs between the brake arm block and boss.

If no clearance occurs, replace the brake lining.
Brake Lining Replacement : Section 5-14.



Check the Reel Brake Clearance

5-13-3. Reel Brake Release Amount Adjustment

Notes

- Be sure to check the release amount of the reel brake when the reel table assembly is removed or when it is replaced.
- Be sure to check the following when performing adjustment with the specification not satisfied.
  (1) Cassette pillar height check (Refer to Section 5-15-3.)
  (2) Reel table height check (Refer to Section 5-13-1)

Basic knowledge

The brake lining is pressed against the reel table when the power is off.
When the power is turned on, the brake lining is released and away from the reel table.
In the PLAY, STOP, REW, F. FWD, SEARCH and REV modes, the brake lining remains released.
Press the EJECT button to put the unit into the EJECT mode. The brake lining is pressed against the reel table a few seconds after the EJECT mode is completed.

Tool

- Wire clearance check gauge set: J-6152-450-A

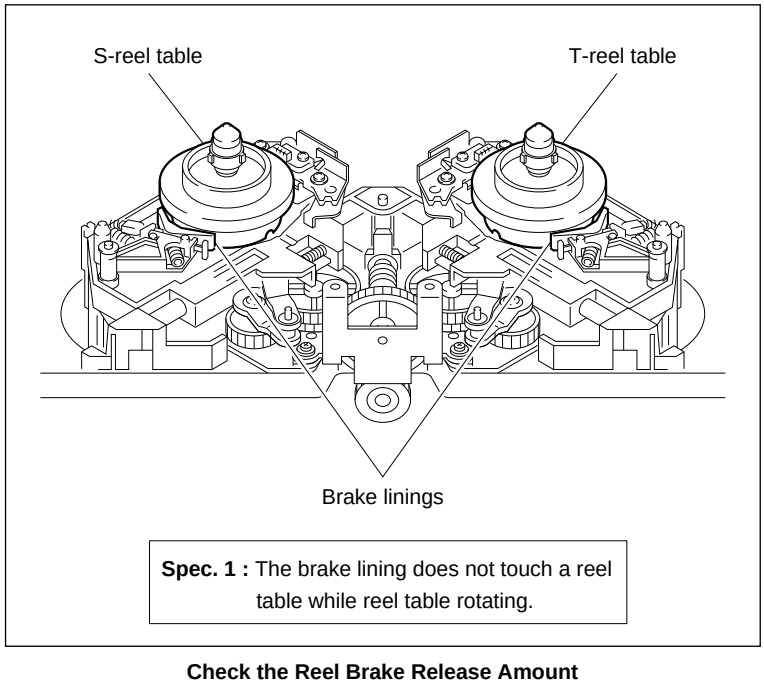
Check

1. Turn the Power On

2. Check the Brake Release Amount

Check on the supply and take-up sides that the brake lining does not touch the reel table while a reel table is rotating. (Specification 1)

If specification 1 is not satisfied, perform steps 3 and later.



Check the Reel Brake Release Amount

Adjustment

3. Turn the Power Off

4. Remove the RS Table Block Assembly
Refer to steps 1 through 3 in Section 5-15-1.
(It is not necessary to remove a reel table.)

5. Loosen the Screws
Loosen the two screws fixing the brake solenoid.

6. Adjust the Brake Solenoid Position
Press down the iron core of the brake solenoid to the energized position.
At that time, adjust the brake solenoid position so that the clearance between the brake lining and reel table satisfies specification 2.

Note

Press down only the iron core by a sharp-pointed stick. Do no touch other portions.

Know-how:
- Shift the brake solenoid upward.
  →Clearance A is narrowed.
- Shift the brake solenoid downward.
  →Clearance A is widened.

7. Tighten the Screws
Tighten the two screws loosened in step 5.

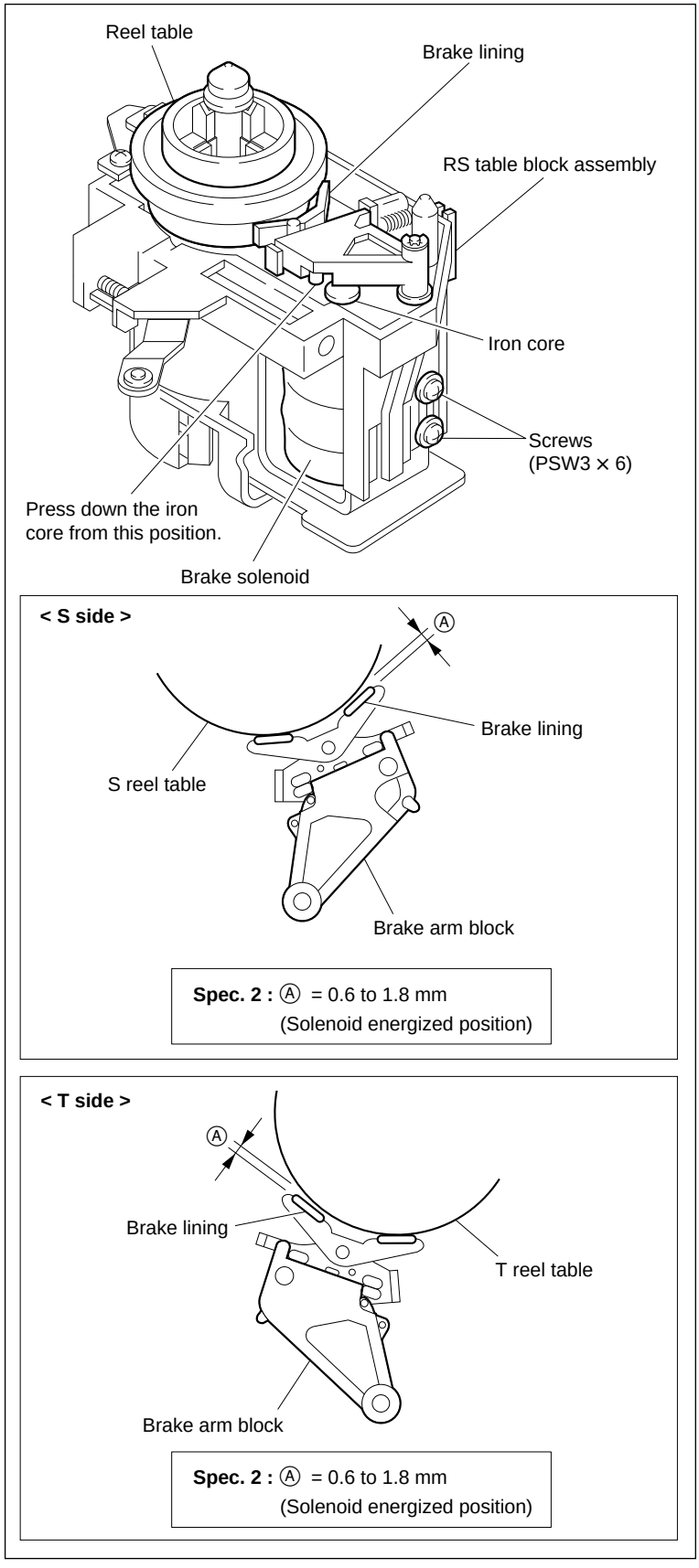
Tightening torque : 98×10^{-2} N • m
{10.0 kgf • cm}

8. Recheck the Brake Solenoid Position
Refer to step 6.

9. Attach the RS Table Block Assembly
Refer to steps 9 through 13 in Section 5-15-1.
(It is not necessary to smear grease again to the slide shaft or to apply oil again to the crank arm (A).)

10. Check the Cassette Pillar Height
Refer to Section 5-15-3.

11. Check the Reel Table Height
Refer to Section 5-13-1.



Check the Reel Brake Release Amount

5-13-4. Reel Table Rotation Sensor Position Adjustment

Note

- Be sure to check the position of the reel table rotation sensor when a reel motor assembly or reel table is replaced.

Tools

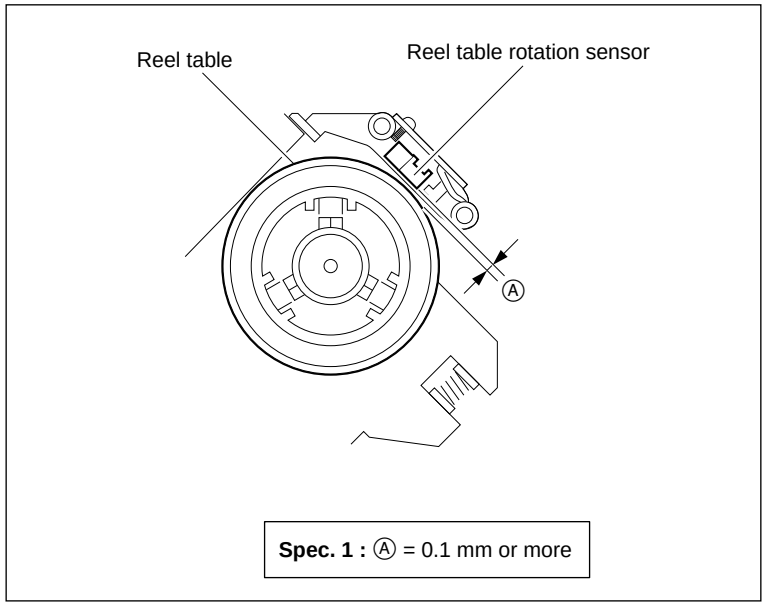
- Thickness gauge: 9-911-053-00
- Torque screwdriver (6 kg•cm) (JB-5251): J-6252-510-A
- Betacam cassette tape

Check

1. Check the Reel Table Rotation Sensor Clearance

Check that the clearance between the reel table and the reel table rotation sensor satisfies the specification 1.

If the specification 1 is not satisfied, perform steps 4 and later.



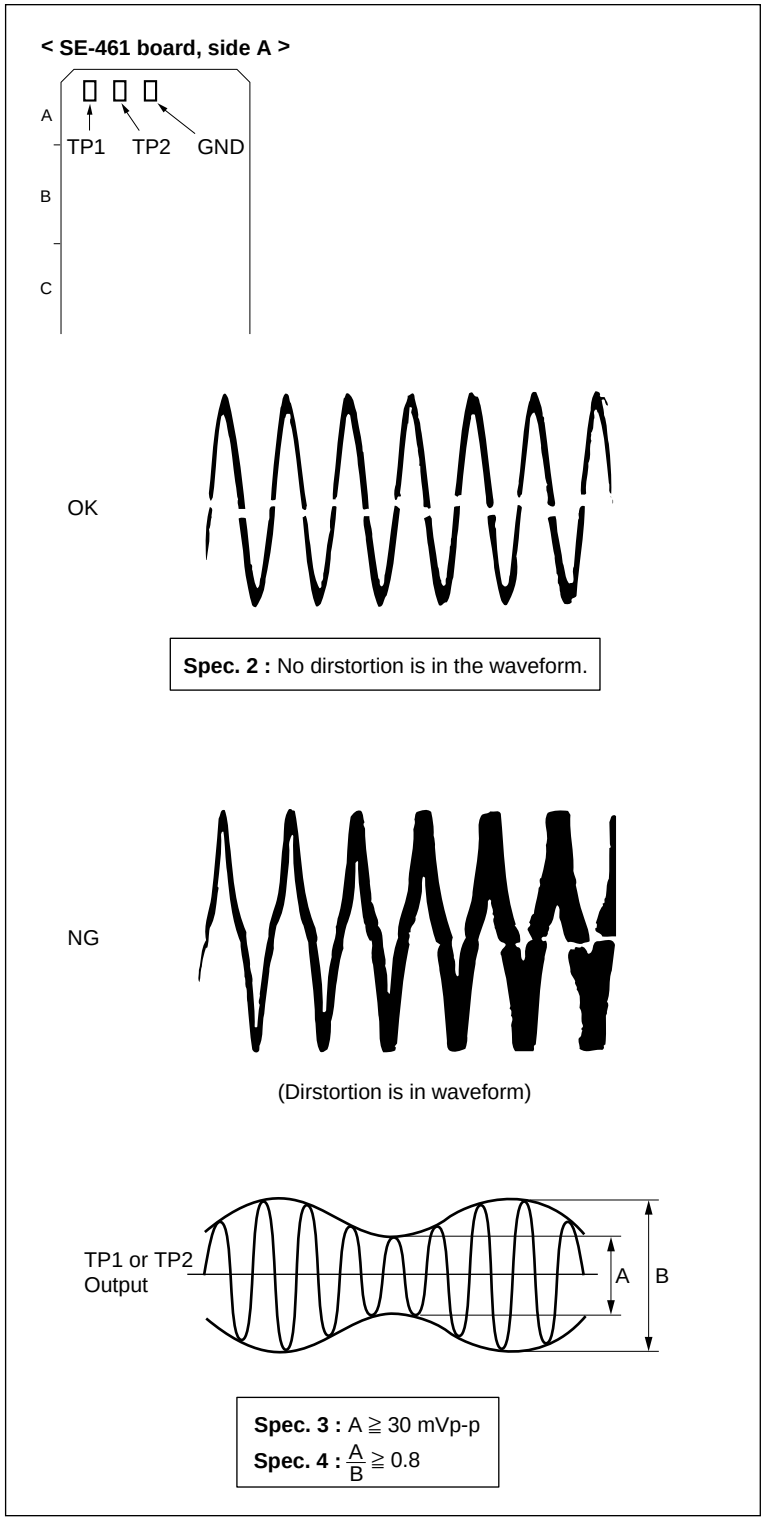
Check the Reel Table Rotation Sensor Clearance

2. Connect the Oscilloscope

CH-1: TP1/SE-461 board (S-FG signal)
CH-2: TP2/SE-461 board (T-FG signal)

3. Check the Reel FG Output Level

(1) Turn the power on.
(2) Put the EJECT mode by putting the EJECT button.
(3) Insert the cassette tape.
(4) Put the unit into the PLAY mode, then check the outputs of CH-1 and CH-2 satisfy the specification 2.
(5) Eject the cassette tape by putting the EJECT button.
(6) Put the unit into the STOP mode in a state of without the cassette tape in the unit by putting the STOP button.
(7) In the step (6), check that the outputs of CH-1 and CH-2 satify specifications 3 and 4.



Check the Reel FG Output Level

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Adjustment

4. Loosen the Screws

Loosen the two screws by 1/4 to 1/2 turn.

5. Adjust the Reel Table Rotation Sensor Position

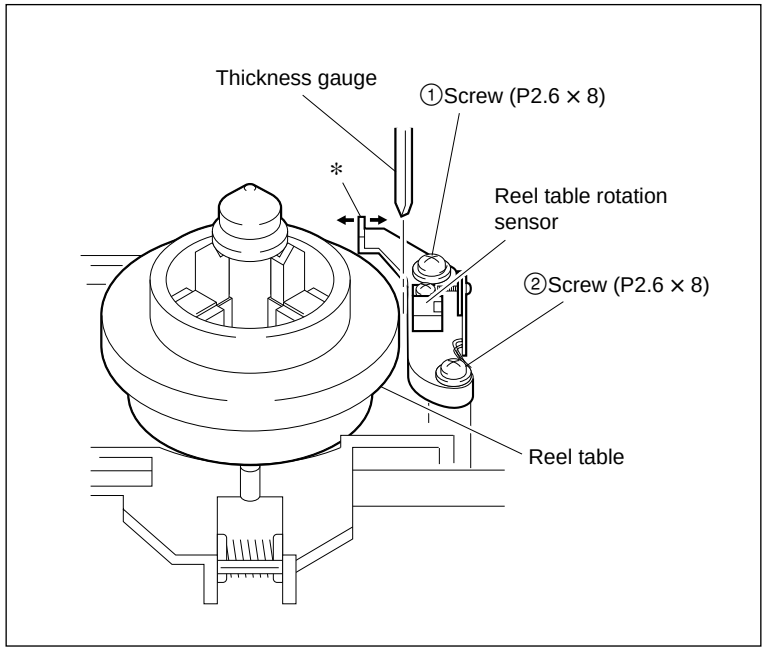
(1) Put the unit into the STOP mode in a state of without cassette tape by putting the STOP button.

(2) Adjust the position of the reel table rotation sensor so that the distortion is not in the waveform, and maximize.

- Adjustment method
  Grasp the portion "*" with the finger, and adjust the sensor to slightly move in the direction of the left and right.

(3) Tighten the two screws loosen in step 4 in oder of ① and ② while keeping the state of the step (2).

Tightening torque: 49×10^{-2} N•m
(5 kgf • cm)



Adjust the Reel Table Rotation Sensor Position

6. Recheck the Reel Table Rotation Sensor Position

(1) Insert the thickness gauge (t=0.1 mm) between the reel table rotation sensor and the reel table.

Note

Be careful not to damage the reel flange and the reel table rotation sensor.

(2) Rotate the reel table, and check that it rotates smoothly.

(3) Recheck that the specifications 1 through 4 are satisfied referring to steps 1 through 3.

5-14. Brake Lining Replacement

Outline

Replacement

1. Remove the Reel Table Assembly
2. Remove the Brake Assembly
3. Remove the Brake Lining
4. Attach the Brake Lining
5. Attach the Brake Assembly
6. Attach the Reel Table Assembly

Adjustment after Replacement

7. Confirm the Reel Table Height (Refer to Section 5-13-1.)
8. Confirm the Reel Brake Clearance (Refer to Section 5-13-2.)
9. Confirm the Reel Brake Release (Refer to Section 5-13-3.)

Notes

- The brake lining replacement is the same on the supply (S) and take-up (T) sides.
- Use a new E ring when the brake lining is replaced.
  E ring (2.3): 7-624-105-04

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment assembly. (Refer to Section 1-5.)

Tools

- L wrench (Across flat has 1.5 mm): 7-700-736-05
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

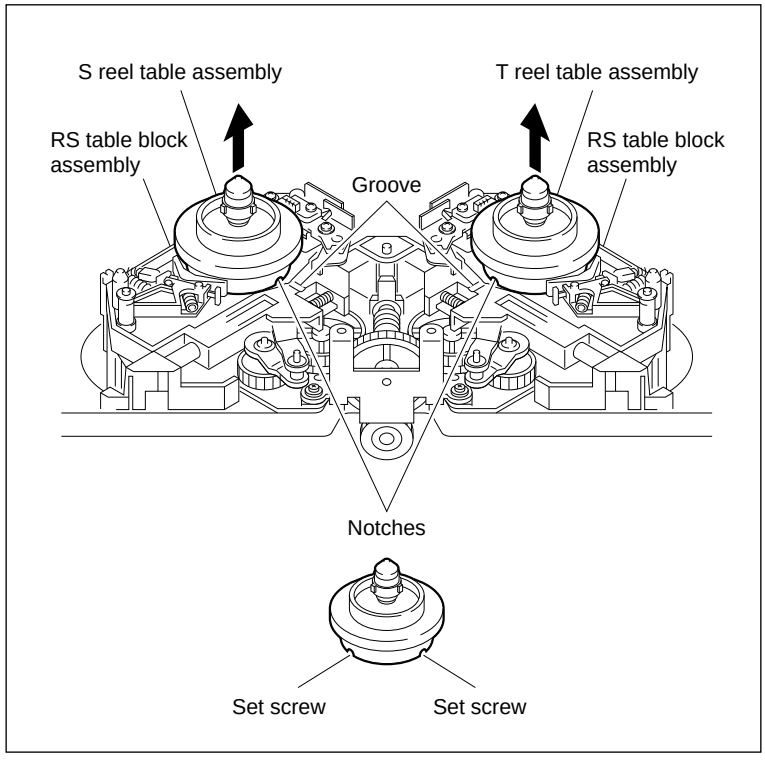
Removal

1. Remove the Reel Table Assembly

(1) Align one of the two notches at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(2) Insert the L wrench into the notch at the bottom of the reel table assembly along the groove of the RS table block assembly.
(3) Turn the set screw counterclockwise by 1/2 to one turn, then loosen.
(4) Align the other notch at the bottom of the reel table assembly with the groove position of the reel shift plate assembly.
(5) Loosen the other set screw in the same way as in step (2).
(6) Remove the reel table assembly.

Note

A polywasher may be attached together when the reel table assembly is removed. In this case, remove the polywasher from the reel table assembly and return it to the reel motor shaft. The polywasher is used for reel table height adjustment.



Remove the Reel Table Assembly

2. Remove the Brake Assembly

(1) Remove the spring put on the RS table block assembly.
(2) Remove the E ring, then remove the brake assembly.

3. Remove the Brake Lining

Remove the spring put on the brake arm block, then remove the brake lining.

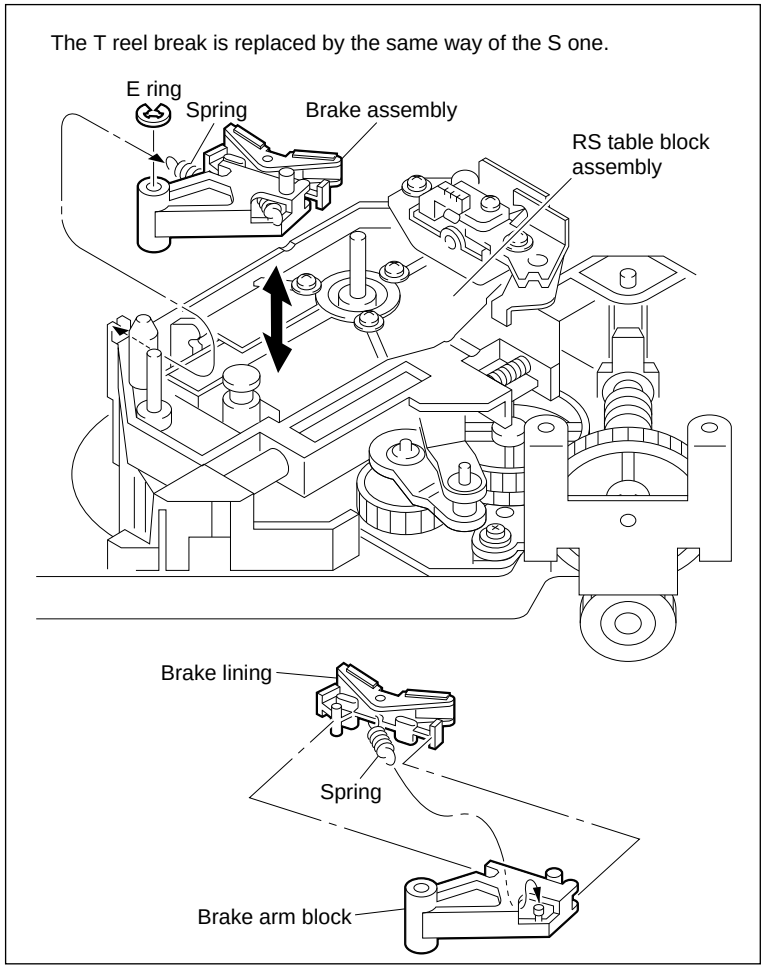
Installation

4. Attach the Brake Lining

(1) Combine a new brake lining and brake arm block as shown in the figure.
(2) Hook the spring on the brake arm block.

5. Install the Brake Assembly

(1) Pass the brake assembly through the shaft of the RS table block assembly.
(2) Hook the spring on the RS table block assembly.
(3) Attach the brake assembly with a new E ring.



Remove/Attach the Brake Assembly and Brake Lining

6. Attach the Reel Table Assembly

(1) Clean the circumference of the reel table assembly.
(2) Push the reel brake in the direction indicated by the arrow to make free, and pass the reel table assembly through the reel motor shaft.

Note

Tighten the two set screws of the reel table assembly after the reel table height confirmation is completed.

Adjustment after Replacement

7. Confirm the Reel Table Height

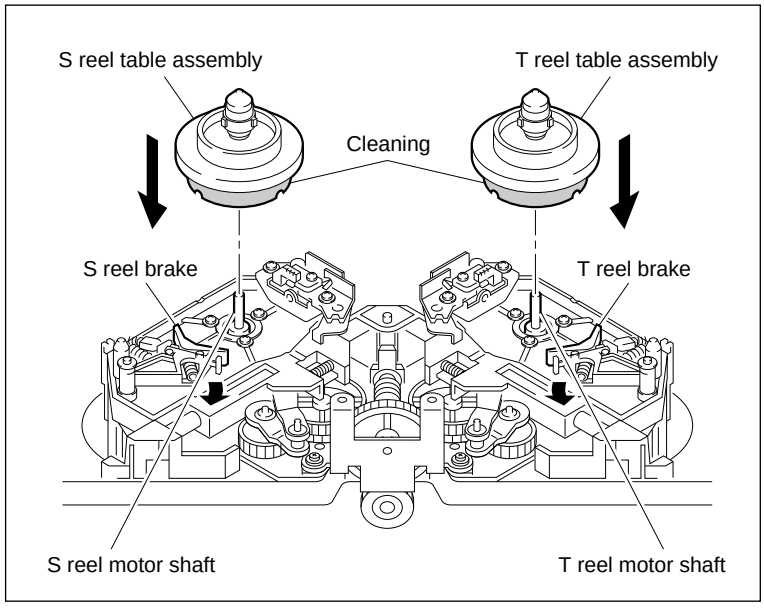
Refer to Section 5-13-1.

8. Confirm the Reel Brake Clearance

Refer to Section 5-13-2.

9. Confirm the Reel Brake Release

Refer to Section 5-13-3.



Attach the Reel Table Assembly

5-15. Reel Motor Assembly Replacement

Replace the reel motor assembly every 4,000 hours of tape-running.

5-15-1. Replacement Procedure of the Reel Motor Assembly

Outline

Replacement

1. Remove the Reel Table Assembly
2. Remove the Crank Arm and Slide Shaft Support
3. Remove the RS Table Block Assembly
4. Disconnect the Harnesses
   (S side: CN926 and 927/RM Board, T side: CN926 and 927/RM Board)
5. Remove the Reel Motor Assembly
6. Cleaning
7. Attach the Reel Motor Assembly
8. Connect the Harnesses
   (S side: CN926 and 927/RM Board, T side: CN926 and 927/RM Board)
9. Connect the Flat Cable
   (S side: CN923/RM Board, T side: CN923/RM Board)
10. Insert the Slide Shaft
11. Attach the RS Table Block Assembly
12. Apply the Grease to the Slide Shaft
13. Attach the Crank Arm

Adjustment after Replacement

14. Confirm the Reel Motor Shaft Slantness (Refer to Section 5-15-2.)
15. Attach the Reel Table Assembly
16. Confirm the Cassette Pillar Height (Refer to Section 5-15-3.)
17. Confirm the Reel Table Height (Refer to Section 5-13-1.)
18. Confirm the Reel Brake Clearance (Refer to Section 5-13-2.)
19. Confirm the Reel Brake Release Amount (Refer to Section 5-13-3.)
20. Perform the Rell Table Rotation Sensor Position Adjustment
    (Refer to Section 5-13-4.)
21. Confirm the Reel Motor Operation (Refer to Section 3-2-2.)
    (C010: S REEL MOTOR, C011: T REEL MOTOR)
22. Perform the Reel FG Duty Adjustment (Refer to Section 3-2-5.)
    (A001: S REEL FG DUTY, A002: T REEL FG DUTY)
23. Perform the Reel Motor Offset/Friction Adjustment (Refer to Section 3-2-5.)
    (A004: S REEL OFFSET/FRIC, A005: T REEL OFFSET/FRIC)
24. Perform the Reel Torque Adjustment (Refer to Section 3-2-5.)
    (A006: S REEL TORQUE, A007: T REEL TORQUE)
25. Perform the Adjusted Data Save (Refer to Section 3-2-5.)
    (A012: NV-RAM CONTROL)

Note

The parts consisting reel motor is different between S side and T side. However, how to replace the reel motor assembly is the same for both sides.

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD. (Refer to Section 1-4.)
4. Remove the cassette compartment. (Refer to Section 1-5.)

Tools

- L-shaped wrench (1.5 mm): 7-700-736-05
- Torque screwdriver (12 kg•cm) (JB-5252): J-6252-520-A
- Torque screwdriver's bit (+ 3 mm, l = 90 mm): J-6323-430-A
- Grease (SGL-601): 7-651-000-10
- Oil: 7-661-018-18
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

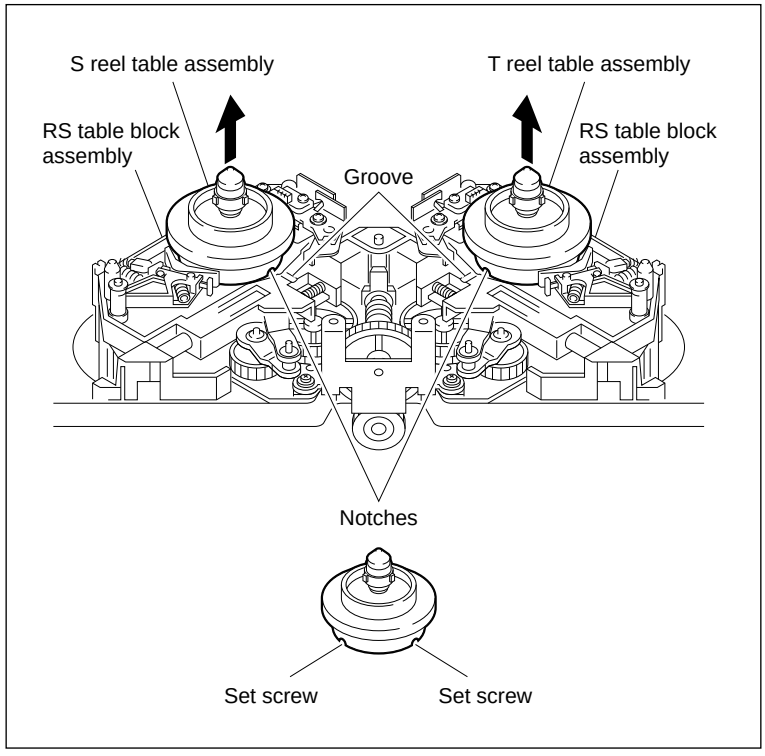
Removal

1. Remove the Reel Table Assembly

(1) Align one of the two notches at the bottom of the reel table assembly with the groove of the RS table block assembly.
(2) Insert the L-shaped wrench into the notch of the reel table assembly along the groove of the RS table block assembly.
(3) Loosen the set screw.
(4) Align another notch of the reel table assembly with the groove of the RS table block assembly.
(5) Loosen the other set screw in the same way as in step (2).
(6) Remove the reel table assembly.

Note

When the reel table assembly is removed, a poly-slider washer may adhere to it. In this case, remove it from the reel table assembly and return it to the reel motor shaft position.
This poly-slider washer is used for reel table height adjustment.



Remove the Reel Table Assembly

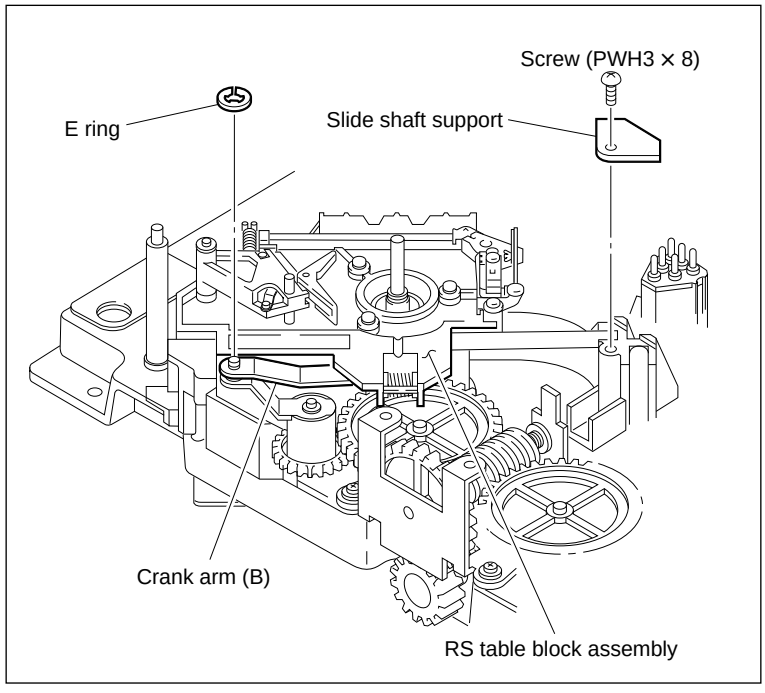
2. Remove the Crank Arm and Slide Shaft Holder

(1) Place the RS table block assembly in the middle between S and L cassette positions.

Note

The RS table block assembly assembly cannot be removed in the S cassette position or T cassette position.

(2) Remove the E ring and remove the crank arm (B).
(3) Remove the screw and remove the slide shaft support.



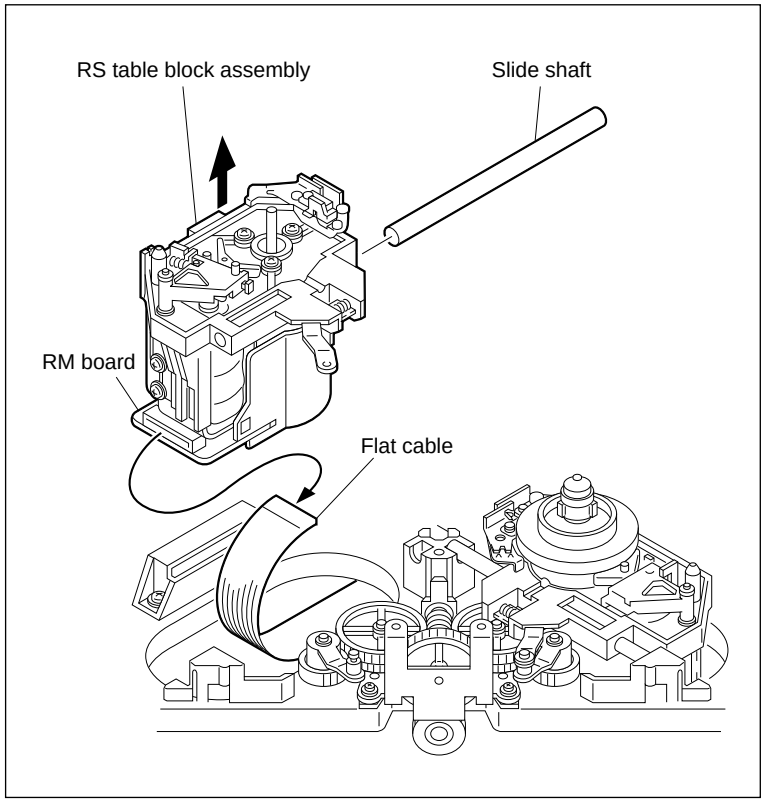
Remove the Crank Arm and Slide Shaft Holder

3. Remove the RS Table Block Assembly

(1) While pulling out the slide shaft, remove the RS table block assembly.
(2) Disconnect the flat cable from the connector on the RM board.
(3) Wipe the grease that is adhering to the holes (two) pulled out the slide shaft on the RS table block assembly using a cloth.
(4) Wipe the grease that is adhering on the surface of the slide shaft using a cloth.

Notes

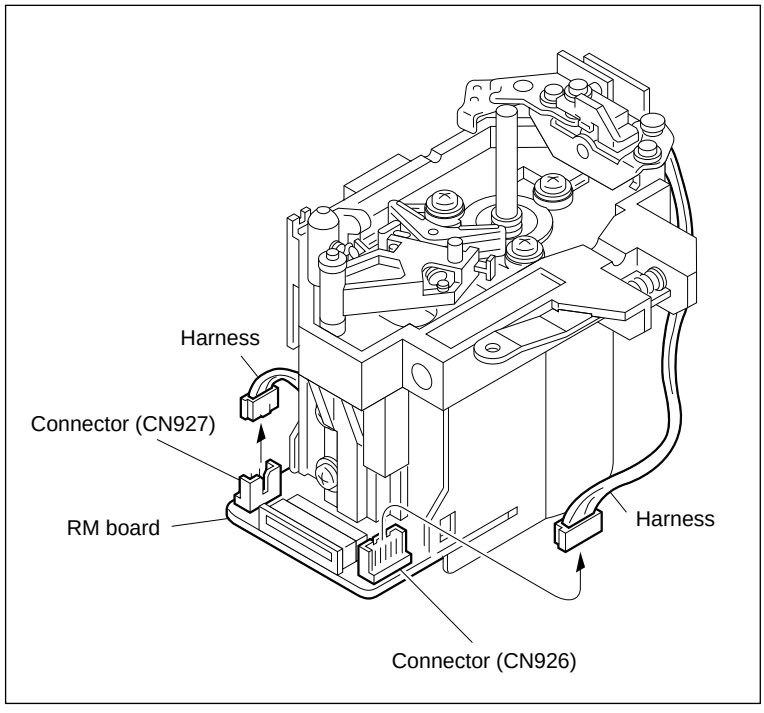
- Be careful not to adhere grease smeared the slide shaft to another parts.
- Be careful not to cause damage to the slide shaft during removal.



Remove the RS Table Block Assembly

4. Disconnect the Harnesses

Disconnect the harnesses from the two connectors CN926 and CN927 on the RM board.



Disconnect the Harnesses

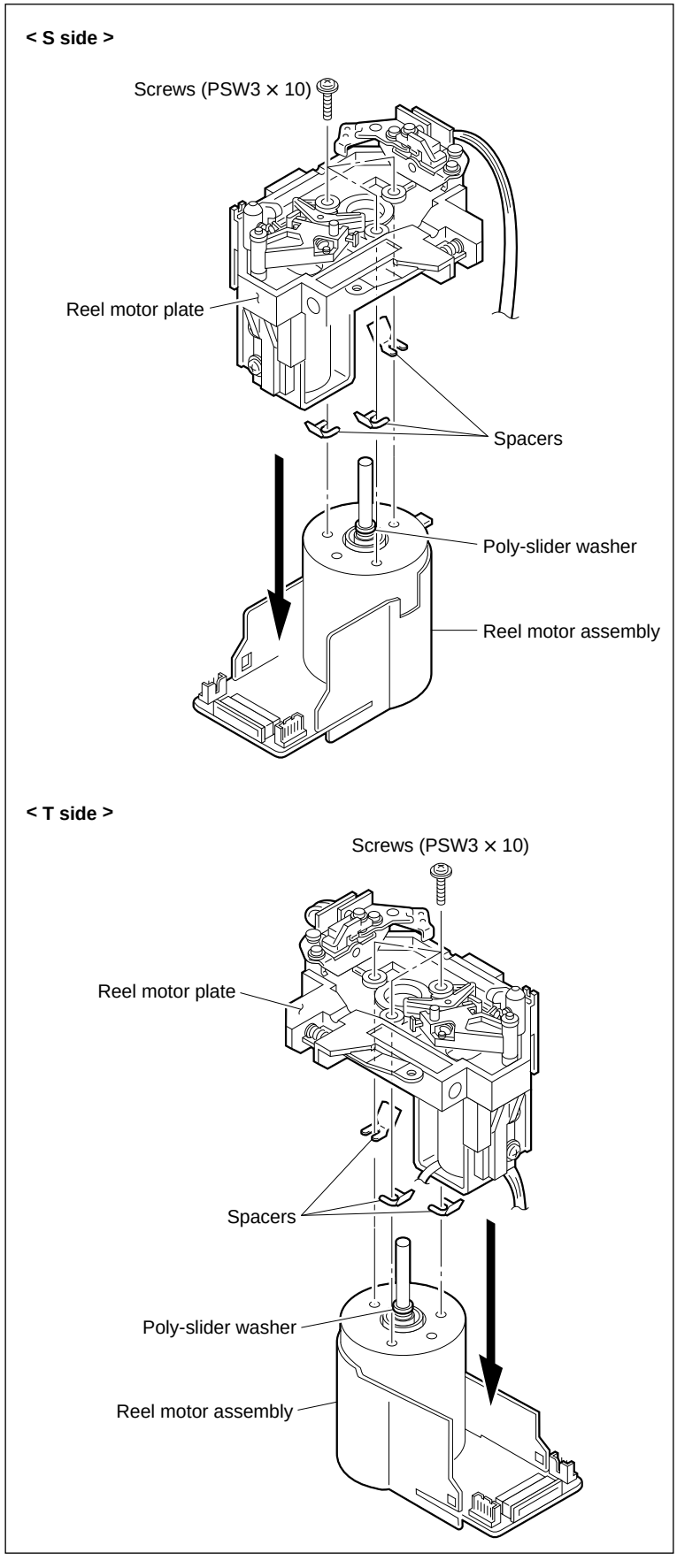
5. Remove the Reel Motor Assembly

(1) Remove the three screws and remove the reel motor assembly.

Note

The spacer(s) is inserted between the reel motor and the reel motor plate. Be careful not to lose spacer(s) since it comes off with the reel motor assembly.

(2) Remove the poly-slider washer from the reel motor shaft.
Be careful not to loose the removed poly-slider washer.



Remove the Reel Motor Assembly

Installation

6. Cleaning

Clean each mounting surface of the reel motor assembly and reel motor plate.

7. Attach the Reel Motor Assembly

(1) Pass the reel motor assembly through the hole of the reel motor plate as in the direction shown in the figure.

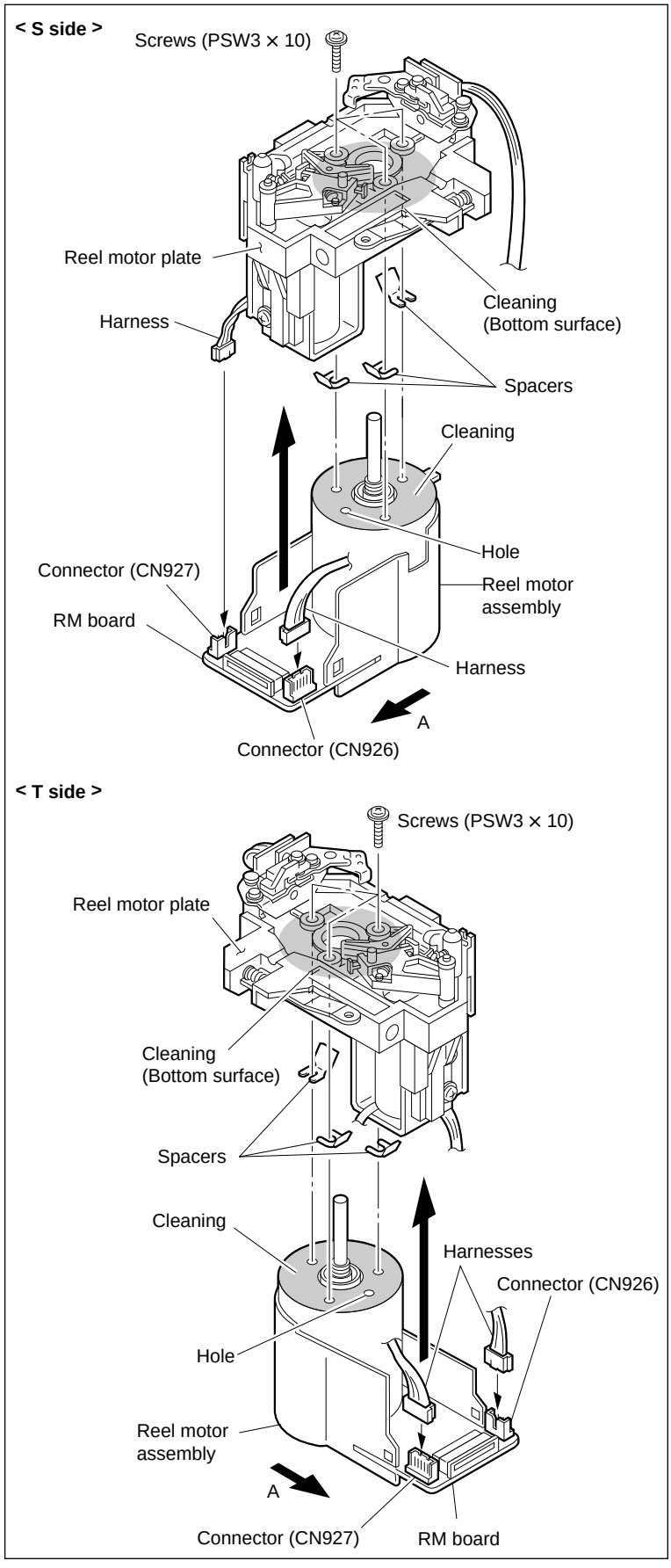
(2) Gradually tighten the three screws while moving the reel motor assembly in the direction indicated by the arrow A.

Tightening torque: 68.6×10^{-2} N • m
{7 kgf • cm}

(3) Pass the poly-slider washer removed in (2) of step 5 through the reel motor shaft.

8. Connect the Harnesses

Connect the harnesses to the two connectors CN926 and CN927 on the RM board.



Attach the Reel Motor Assembly

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Installation

9. Connect the Flat Cable

(1) Clean the inserting position of the flat cable using a dry cleaning cloth.

(2) Connect the flat cable disconnected in step 3 to the connector on the RM board, then lock.

Notes

- Connect the flat cable with its conductor plating part (printing surface) up.
- Be careful not to bend the flat cable when connecting it.

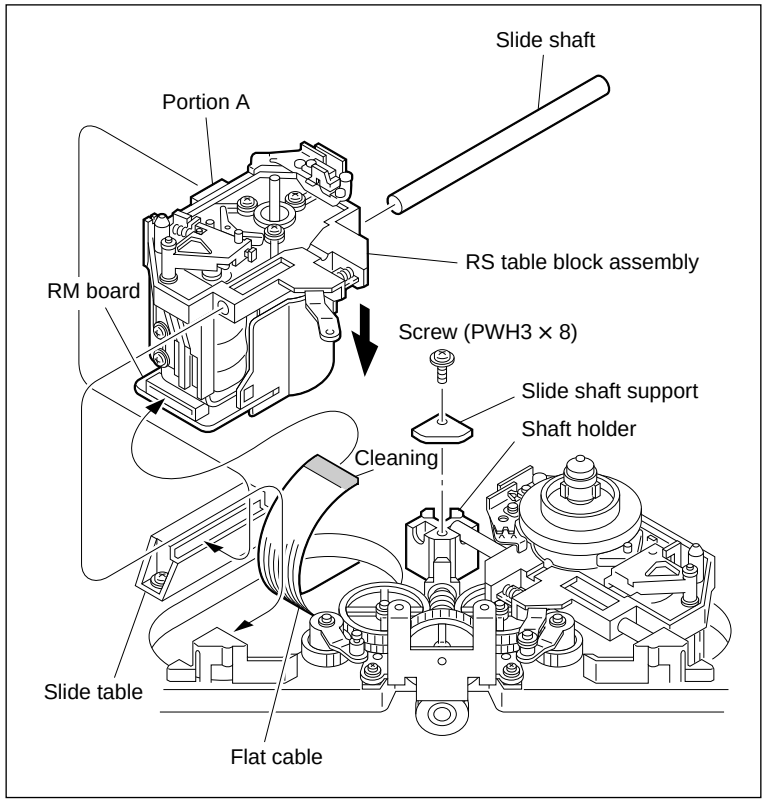
10. Insert the Slide Shaft

Pass the slide shaft through the hole of the RS table block assembly.

11. Attach the RS Table Block Assembly

(1) Put the slide shaft on the shaft holder while inserting the portion A shown in the figure of the RS table block assembly into the slide table.

(2) Attach the slide shaft support with the screw.



Insert the Slide Shaft and Attach the RS Table Block Assembly

12. Apply the Grease to the Slide Shaft

(1) Slightly apply the grease to the slide shaft and extend it to the whole slide shaft.

Note

Be careful that the grease does not adhere to other parts.

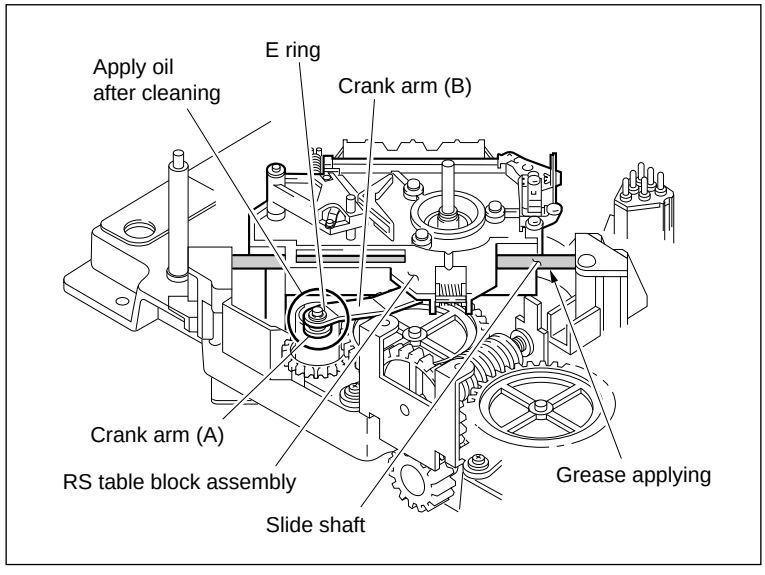
(2) Confirm that the RS table block assembly smoothly moves when it is shifted by hand to S cassette and L cassette positions.

13. Attach the Crank Arm

(1) Clean the shaft of the crank arm (A), then apply one a drop of oil on it.

(2) Confirm that the RS table block assembly is in the middle between S and L cassette positions.

(3) Attach the crank arm (B) to the shaft of the crank arm (A) with the E ring.



Attach the Crank Arm

Adjustment after Replacement

14. Confirm the Reel Motor Shaft Slantness

Refer to Section 5-15-2.

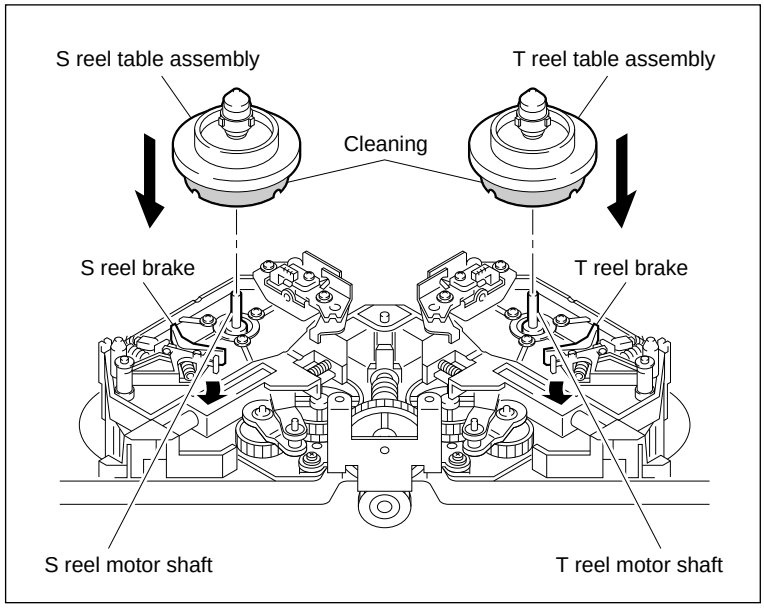
15. Attach the Reel Table Assembly

(1) Clean the circumference of the reel table assembly.

(2) Pass the reel table assembly through the reel motor shaft while moving the reel brake in the direction indicated by the arrow.

Note

Tighten the two set screws after the reel table height confirmation is completed.



Attach the Reel Table Assembly

16. Confirm the Cassette Pillar Height

Refer to Section 5-15-3.

17. Confirm the Reel Table Height

Refer to Section 5-13-1.

18. Confirm the Reel Brake Clearance

Refer to Section 5-13-2.

19. Confirm the Reel Brake Release Amount

Refer to Section 5-13-3.

20. Peform the Reel Table Rotation Sensor Position Adjustment

Refer to Section 5-13-4.

21. Confirm the Reel Motor Operation

Refer to Section 3-2-2.
(C010: S REEL MOTOR,
C011: T REEL MOTOR)

22. Perform the Reel FG Duty Adjustment

Refer to Section 3-2-5.
(A001: S REEL FG DUTY,
A002: T REEL FG DUTY)

23. Perform the Reel Offset/Friction Adjustment

Refer to Section 3-2-5.
(A004: S REEL OFFSET/FRIC,
A005: T REEL OFFSET/FRIC)

24. Perform the Reel Torque Adjustment

Refer to Section 3-2-5.
(A006: S REEL TORQUE,
A007: T REEL TORQUE)

25. Perform the Adjusted Data Save

Refer to Section 3-2-5.
(A012: NV-RAM CONTROL)

5-15-2. Reel Motor Shaft Slantness Adjustment

Notes

- Be sure to check the slantness of the reel motor shaft when the reel motor assembly is removed or when the RS table block assembly is removed.
- Perform the reel motor shaft slantness adjustment correctly.
  If this adjustment is not performed correctly, a reel hub touches the case in a cassette tape, a noise occurs, and the tape does not run correctly. This may damage the tape.

Tools

- Cassette reference plate (L) (MW-088): J-6320-880-A
- Reel motor shaft slantness check tool (MW-087): J-6320-870-A
- Thickness gauge: 9-911-053-00
- Torque screwdriver (12 kg•cm) (JB-5252): J-6252-520-A
- Torque screwdriver's bit (+3 mm, l=50 mm): J-6323-430-A

Check

1. Set the Cassette Reference Plate (L)

Place the cassette reference plate (L) in the direction shown in the figure, then place it on two cassette supports.

2. Place the Reel Shift Plate Assembly in the L Cassette Position

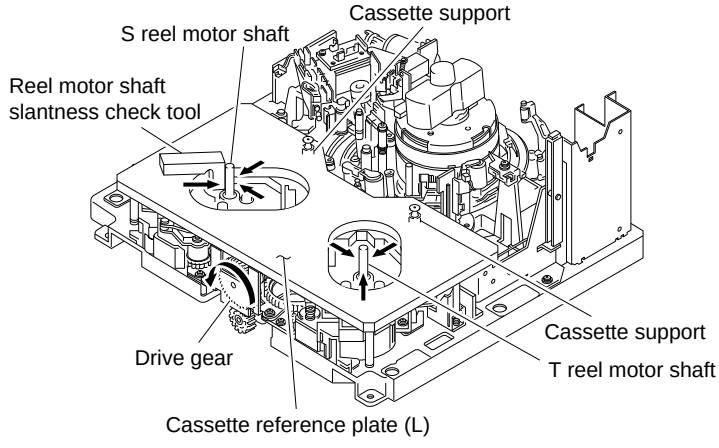
Rotate the drive gear counterclockwise as far as it will go.

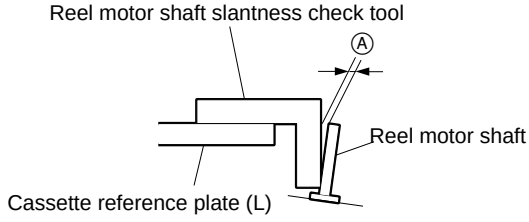
3. Check the Slantness in the L Cassette Position

(1) Press the check tool against the reel motor shaft from the directions indicated by the arrow.
(2) Check that the clearance between the reel motor shaft and tool satisfies specification 1.

If the specification is not satisfied, perform steps 6 through 10.

< L cassette position >





Spec.1 : (L cassette position)
A ≦ 0.03 mm

Check the Reel Motor Shaft Slantness (L)

4. Place the Reel Shift Plate Assembly in the S Cassette Position

Rotate the drive gear clockwise as far as it will go.

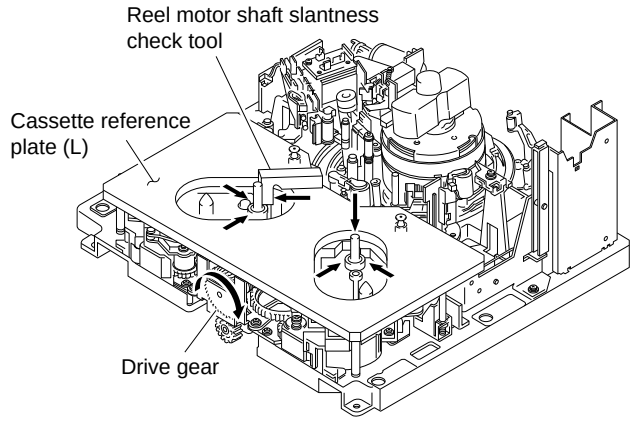
5. Check the Slantness in the S Cassette Position

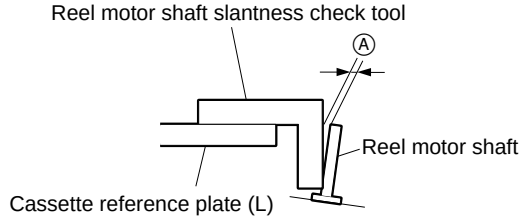
(1) Press the check tool against the reel motor shaft from the directions indicated by the arrow.

(2) Check that the clearance between the reel motor shaft and tool satisfies specification 2.

If the specification is not satisfied, perform steps 6 and later.

< S cassette position >





Spec. 2 : (S cassette position)
A ≦ 0.1 mm

Check the Reel Motor Shaft Slantness (S)

Adjustment

6. Loosen Screws

Loosen the three screws fixing the reel motor by one to two turns.

7. Bend Spacer

Bend the adjustment spacer as shown in the figure.

8. Insert Spacer

Insert the adjustment spacer into the square hole on the upper surface of the reel motor plate with tweezers.

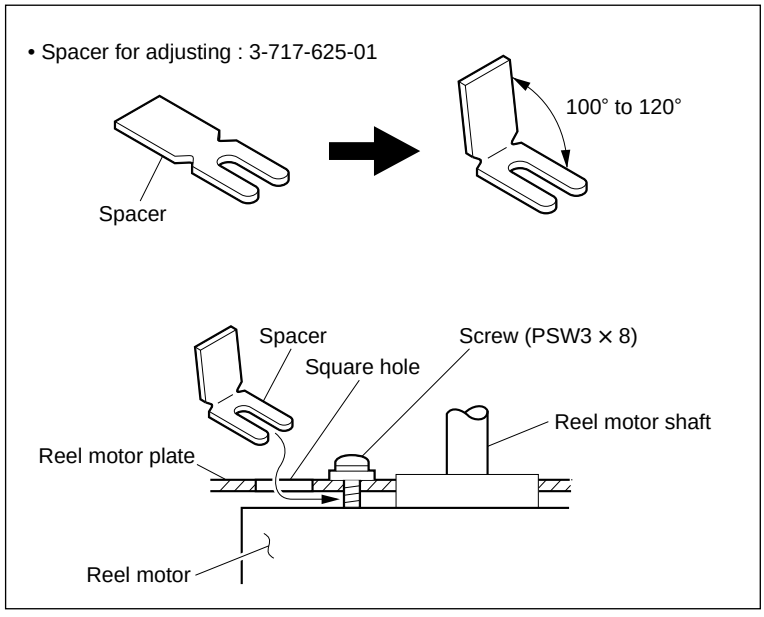
9. Tighten Screws

Gradually tighten the three screws loosened in step 6.

Tightening torque: 68.6×10^{-2} N • m
{7 kgf • cm}

10. Recheck the Reel Motor Shaft Slantness

Refer to steps 2 through 5.



Ajustment the Reel Motor Shaft Slantness

5-15-3. Cassette Pillar Height Adjustment

Note

- Be sure to check the height of the cassette pillars when the reel shift plate assembly is removed.

Tools

- Cassette reference plate (L) (MW-088): J-6320-880-A
- Small dental mirror (circular): J-6080-029-A
- L-shaped wrench (1.5 mm): 7-700-736-05

Check

1. Set the Cassette Reference Plate (L)

Place the cassette reference plate (L) in the direction shown in the figure, then place it on two cassette pillars.

2. Place the Reel Shift Plate Assembly in the Middle between S and L Cassette Positions

(1) Rotate the drive gear and place the reel shift plate assembly in the middle between S and L cassette positions.

Note

The reel shift plate assembly should be moved to the position where the cassette pillars do not appear from the hole of the cassette reference plate (L).

(2) Check that the S and T cassette pillars are positioned under the cassette reference plate (L).

3. Check the Cassette Pillar Height

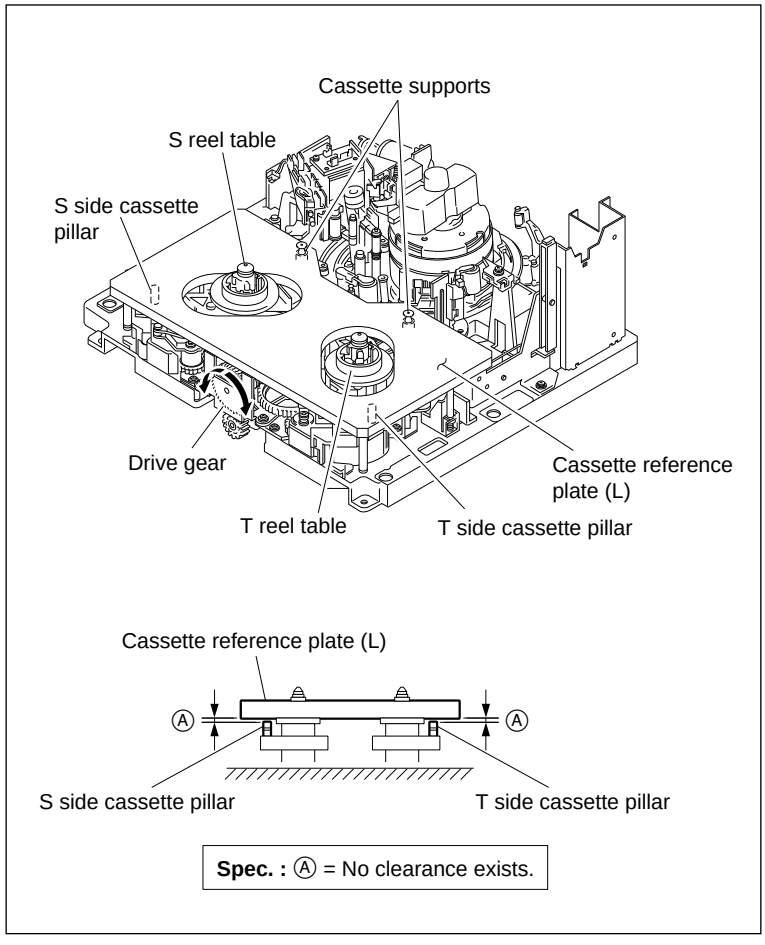
(1) Turn the casstte reference plate (L) over and place it on the cassette pillars.

Note

The reference plate should be turned over because it has a concave portion at the back of the cassette reference plate (L) and cannot be adjusted correctly.

(2) Check with a small dental mirror that there are no clearances between the S and T cassette pillars and the reference plate (L).

If the specification is not satisfied, perform steps 4 through 6.



Check the Cassette Pillar Height

Adjustment

4. Loosen the Securing Screw

Loosen the set screw of the S or T cassette pillar by one to two turns.

5. Adjust the Cassette Pillar Height

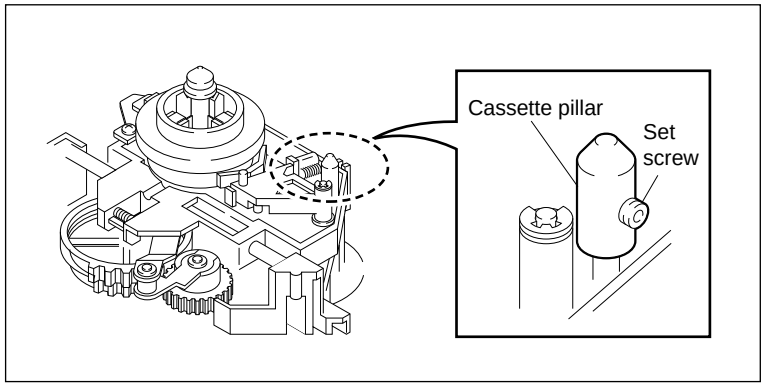
Lift the cassette pillar and press it slightly against the lower surface of the cassette reference plate (L).
Tighten the set screw under this condition.

6. Recheck the Cassette Pillar Height

Check that the height of the S and T cassette pillars satisfy the specification.

Note

Shift the tightening position of the set screw when performing readjustment with the specification not satisfied. (Do not tighten the screw in the same position as previous.)



Adjust the Cassette Pillar Height

5-16. Brake Solenoid Replacement

Outline

Replacement

1. Remove the Reel Table Assembly
2. Remove the Crank Arm and Slide Shaft Support
3. Remove the RS Table Block Assembly
4. Disconnect the Harnesses (CN926 and CN927/RM Board)
5. Remove the Reel Motor Assembly
6. Remove the Brake Assembly
7. Remove the Brake Solenoid
8. Attach the Brake Solenoid
9. Attach the Brake Assembly
10. Cleaning (Reel Motor Assembly)
11. Attach the Reel Motor Assembly
12. Connect the Harnesses (CN926 and CN927/RM Board)
13. Connect the Flat Cable
14. Attach the Slide Shaft
15. Attach the RS Table Block Assembly
16. Applying the Grease to Slide Shaft
17. Attach the Crank Arm

Adjustment after Replacement

18. Confirm the Reel Motor Shaft Slantness (Refer to Section 5-15-2.)
19. Attach the Reel Table Assembly
20. Confirm the Cassette Pillar Height (Refer to Section 5-15-3.)
21. Confirm the Reel Table Height (Refer to Section 5-13-1.)
22. Confirm the Reel Brake Clearance (Refer to Section 5-13-2.)
23. Confirm the Reel Brake Release Amount (Refer to Section 5-13-3.)
24. Confirm the Brake Solenoid Operation (Refer to Section 3-2-2.)
    (C021: S REEL BRAKE, C022: T REEL BRAKE)

Notes

- The brake solenoid replacement and its adjustment after replacement are the same on the supply (S) and take-up (T) sides.
- Use a new E ring when the brake solenoid is replaced.
  E ring (2.3): 7-624-105-04

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment assembly. (Refer to Section 1-5.)

Tools

- L wrench (d = 1.5 mm): 7-700-736-05
- Torque screwdriver (12 kg•cm)(JB-5252): J-6252-520-A
- Torque screwdriver's bit (+3 mm, l = 90 mm): J-6323-430-A
- Grease (SGL-601): 7-651-000-10
- Oil: 7-661-018-18
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

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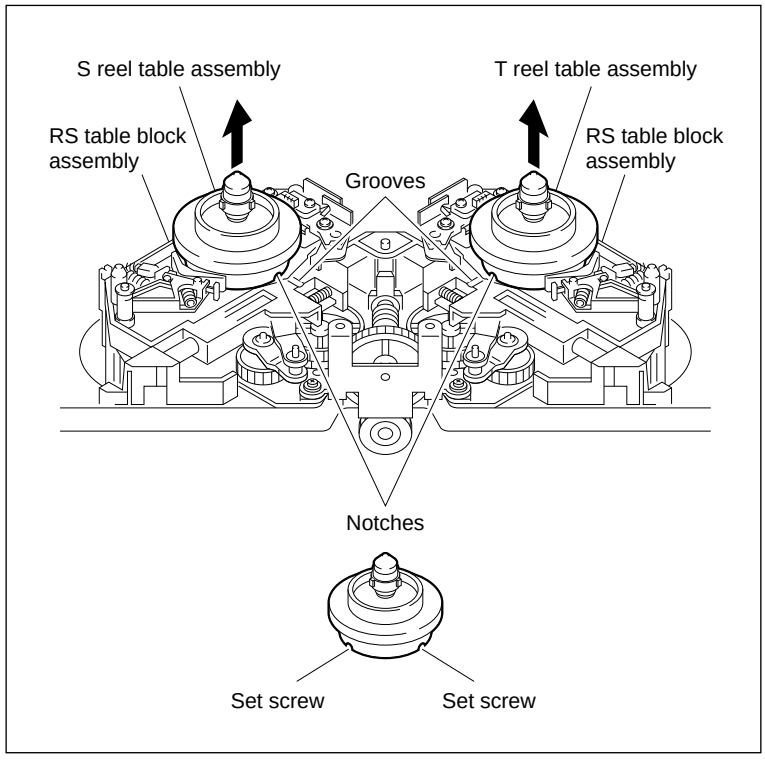
Removal

1. Remove the Reel Table Assembly

(1) Align one of the two notches at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(2) Insert the L wrench into the notch at the bottom of the reel table assembly along the groove of the RS table block assembly.
(3) Loosen the set screw.
(4) Align the other notch at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(5) Loosen the other set screw in the same way as in step (2).
(6) Remove the reel table assembly.

Note

A polywasher may be attached together when the reel table assembly is removed. In this case, remove the polywasher from the reel table assembly and return it to the reel motor shaft. The polywasher is used for reel table height adjustment.



Remove the Reel Table Assembly

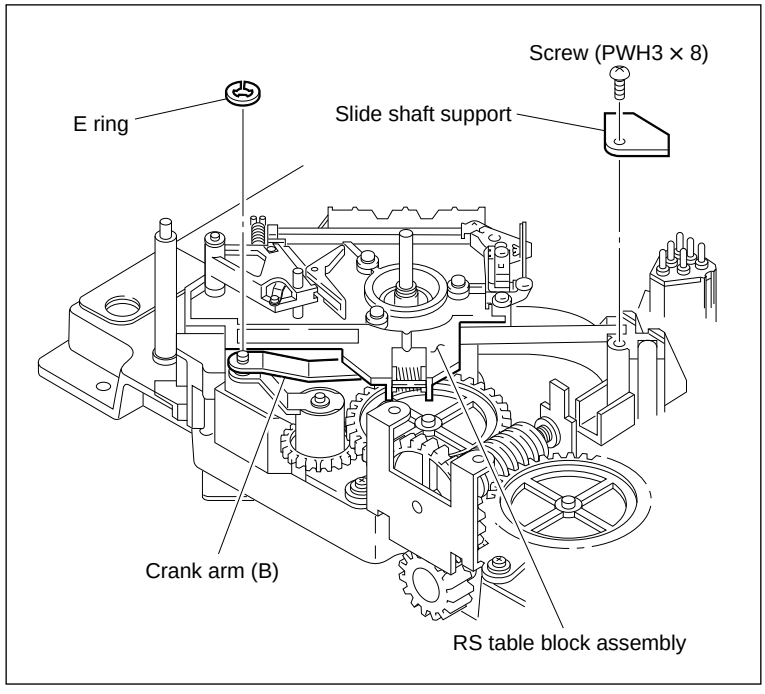
2. Remove the Crank Arm and Slide Shaft Support

(1) Set the RS table block assembly to the middle between S and L cassette positions.

Note

The RS table block assembly cannot be removed in the S or L cassette position.

(2) Remove the E ring, then remove the crank arm (B).
(3) Remove the screw, then remove the slide shaft support.



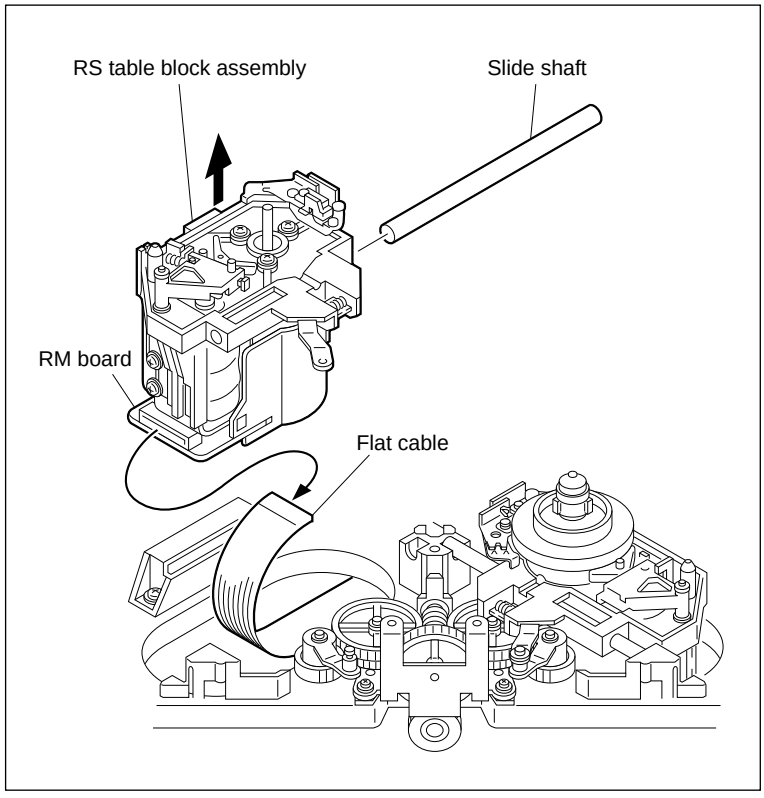
Remove the Crank Arm and Slide Shaft Support

3. Remove the RS Table Block Assembly

(1) Remove the RS table block assembly while pulling out the slide shaft.
(2) Disconnect the flat cable from the connector on the RM board.
(3) Wipe the grease attached on the two holes, from which the slide shaft of the RS table block assembly was pulled out, using cloth.
(4) Wipe the grease attached on the surface of the slide shaft using cloth.

Notes

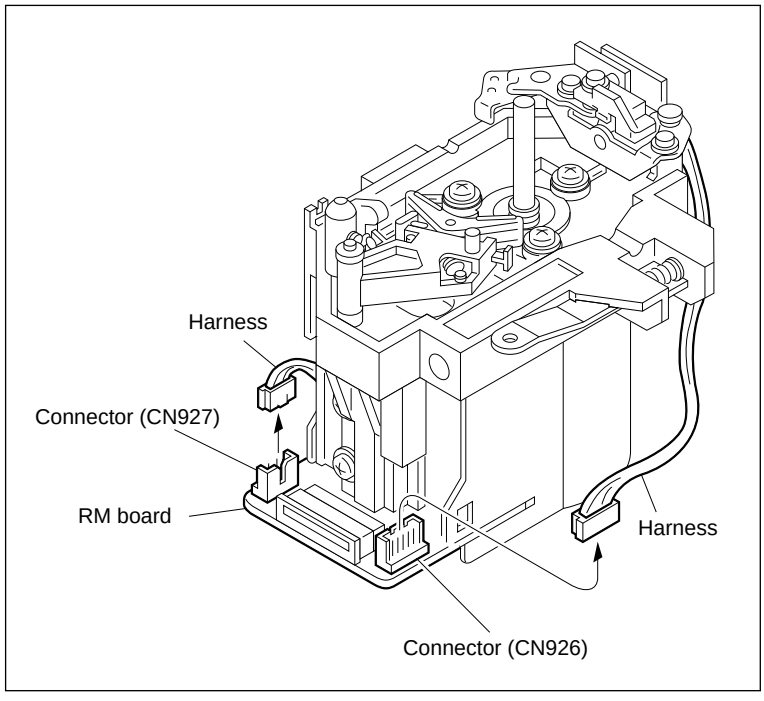
- Be careful the grease on the slide shaft does not adhere to other parts.
- Be careful not to damage the slide shaft.



Remove the RS Table Block Assembly

4. Disconnect the Harnesses

Disconnect the harnesses from the connectors CN926 and CN927 on the RM board.



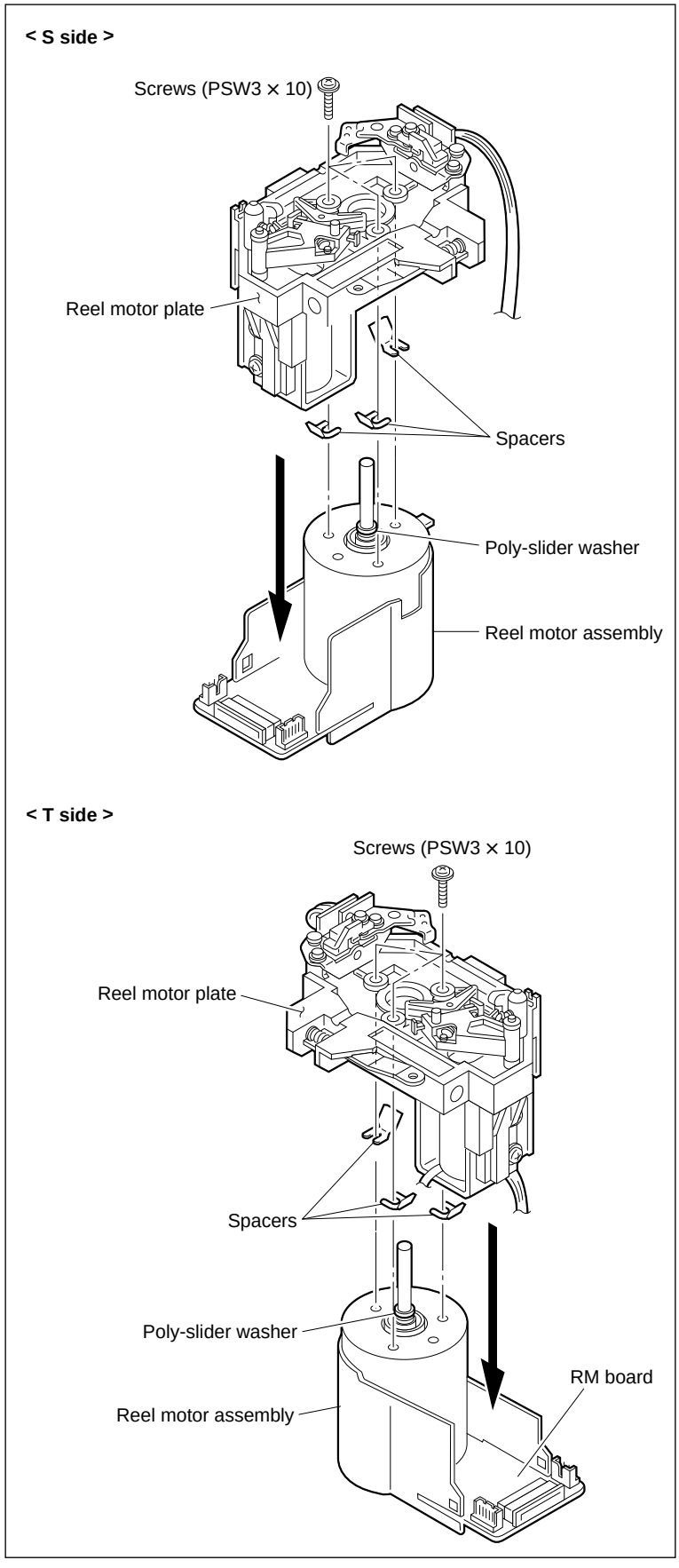
Disconnect the Harnesses

5. Remove the Reel Motor Assembly

Remove the three screws, then remove the reel motor assembly.

Notes

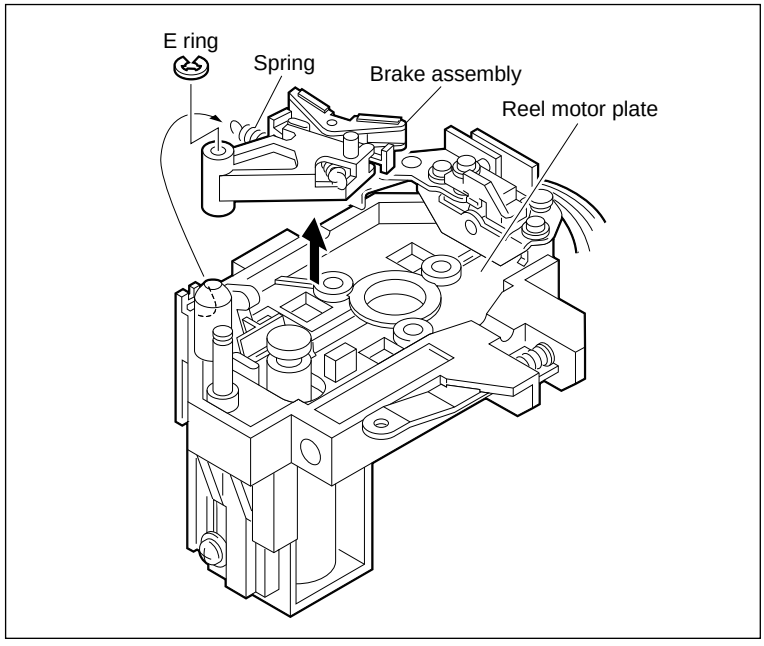
- Spacers are inserted between the reel motor and reel motor plate.
  These spacers are also removed together when the reel motor assembly is removed. Be careful not to lose them.
- Do not remove the poly-slider washer that is passed through the reel motor shaft.



Remove the Reel Motor Assembly

6. Remove the Brake Assembly

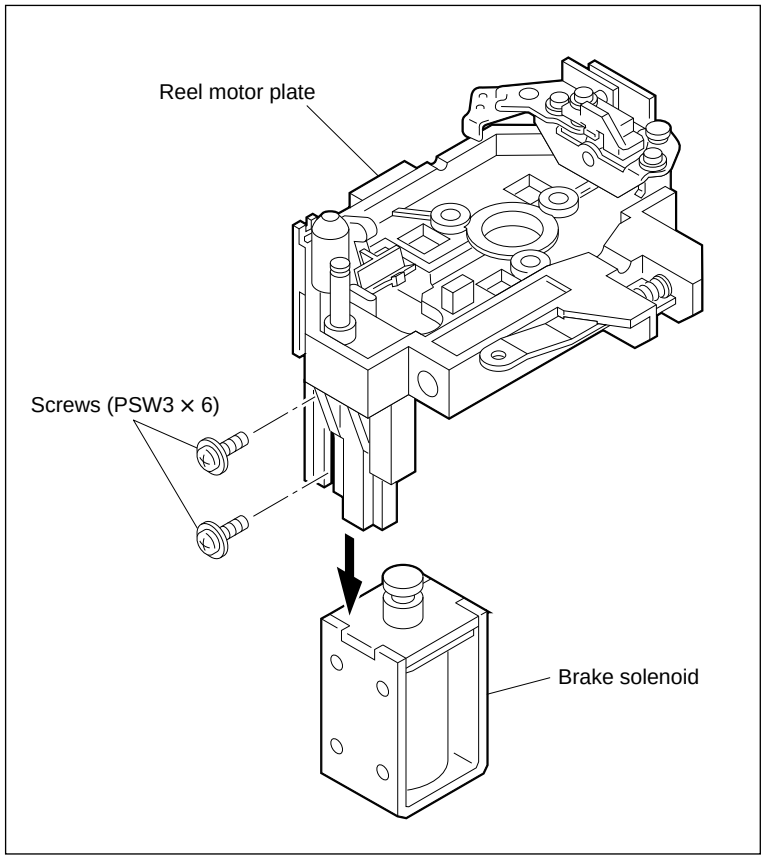
(1) Remove the spring put on the reel motor plate.
(2) Remove the E ring, then remove the brake assembly.



Remove the Brake Assembly

7. Remove the Brake Solenoid

Remove the two screws, then remove the brake solenoid.

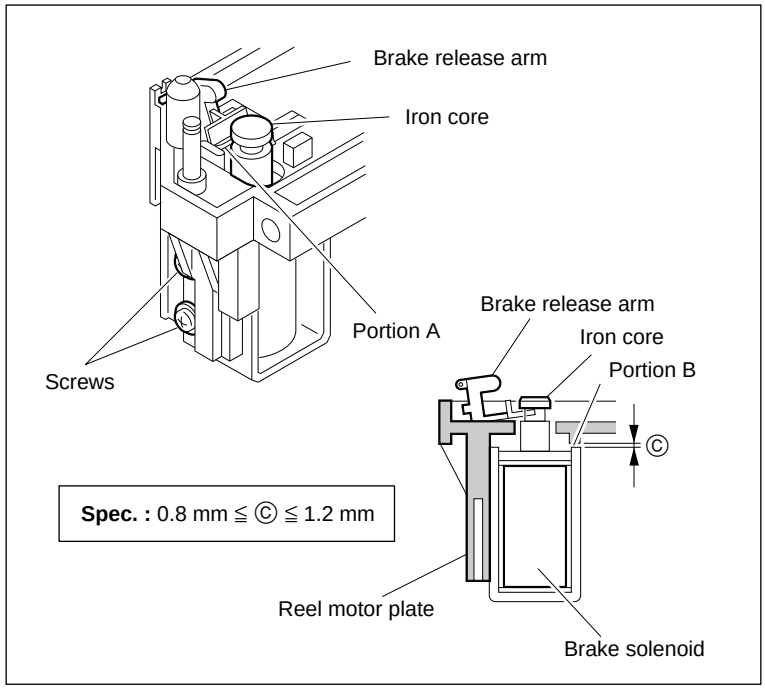


Remove the Brake Solenoid

Installation

8. Attach the Brake Solenoid

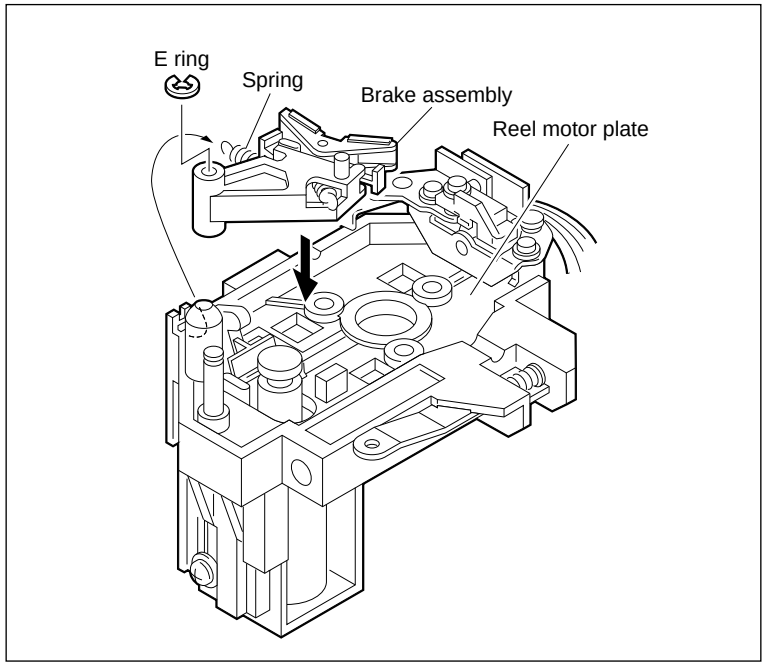
(1) Temporary attach the brake solenoid with two screws while inserting portion A of the brake release arm into the groove of the iron core.
(2) Put a thickness gauge (1.00 mm thick) between the solenoid and reel motor plate (portion B).
(3) Tighten the screws while slightly pushing the solenoid against the reel motor plate.
(4) Pull out the thickness gauge.
(5) Confirm that the clearance between the solenoid and reel motor plate satisfies the specification.



Attach the Brake Solenoid

9. Attach the Brake Assembly

(1) Pass the brake assembly through the shaft of the reel motor plate.
(2) Put the spring on the reel motor plate.
(3) Fix the brake assembly with a new E ring.
E ring (2.3): 7-624-105-04



Attach the Brake Assembly

10. Cleaning

Clean each mounting surface of the reel motor assembly and reel motor plate.

11. Attach the Reel Motor Assembly

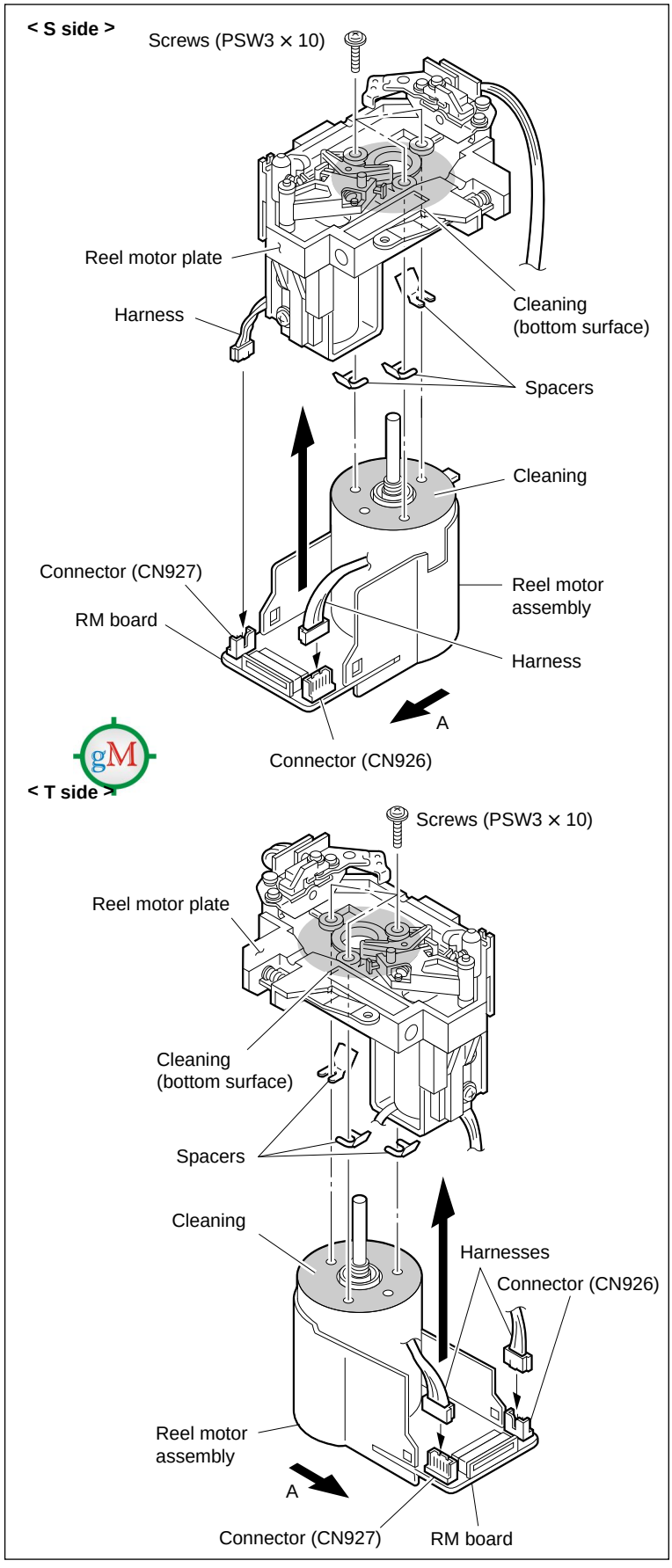
(1) Pass the reel motor assembly through the hole of the reel motor plate in the direction shown in the figure.

(2) Move the reel motor assembly in the direction indicated by arrow A and gradually tighten the three screws.

Tightening torque: 68.6×10^{-2} N • m
{7.0 kgf • cm}

12. Connect the Harnesses

Connect the harnesses to CN926 and CN927 on the RM board.



Install the Reel Motor Assembly

13. Connect the Flat Cable

(1) Clean the conductor plating part of the flat cable using a dry cleaning cloth.
(2) Connect the flat cable disconnected in step 3 to the connector on the RM board, then lock.

Notes

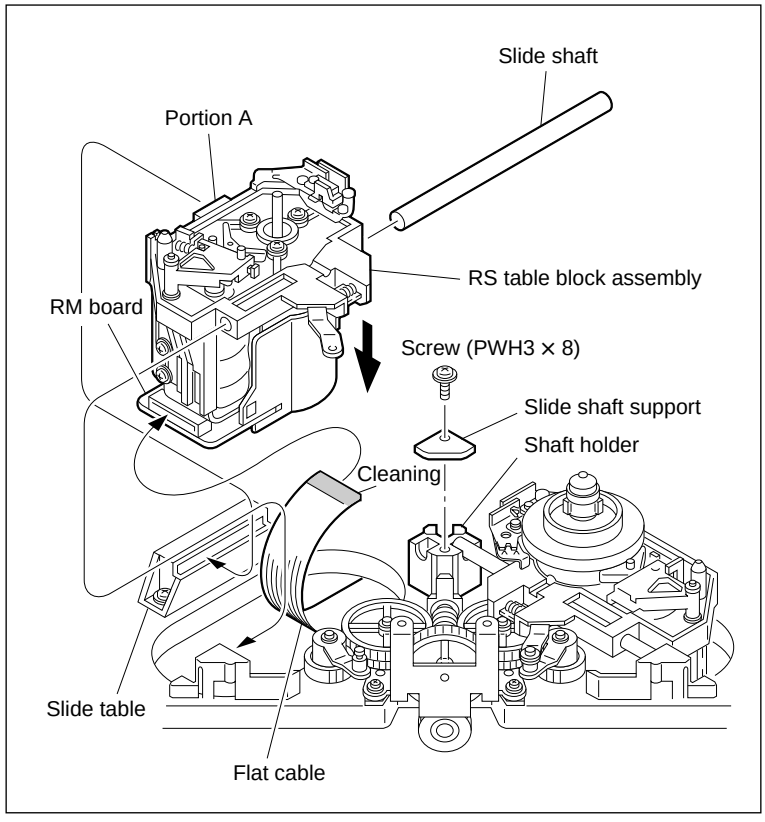
- Connect the flat cable with the conductor plating part (printing side) up.
- Be careful not to bend the flat cable when it is connected.

14. Insert the Slide Shaft

Pass the slide shaft through the hole of the RS table block assembly.

15. Attach the RS Table Block Assembly

(1) Put the slide shaft in the shaft holder while inserting portion A of the RS table block assembly shown in the figure into the slide table.
(2) Attach the slide shaft support with the screw.



Attach the RS Table Block Assembly

16. Apply the Grease to Slide Shaft

(1) Slightly apply the grease to the slide shaft and extend it to the whole slide shaft.

Note

Be careful that the grease dose not adhere to other parts.

(2) Confirm that the RS table block assembly smoothly moves when it is shifted to the S- and L-cassette positions.

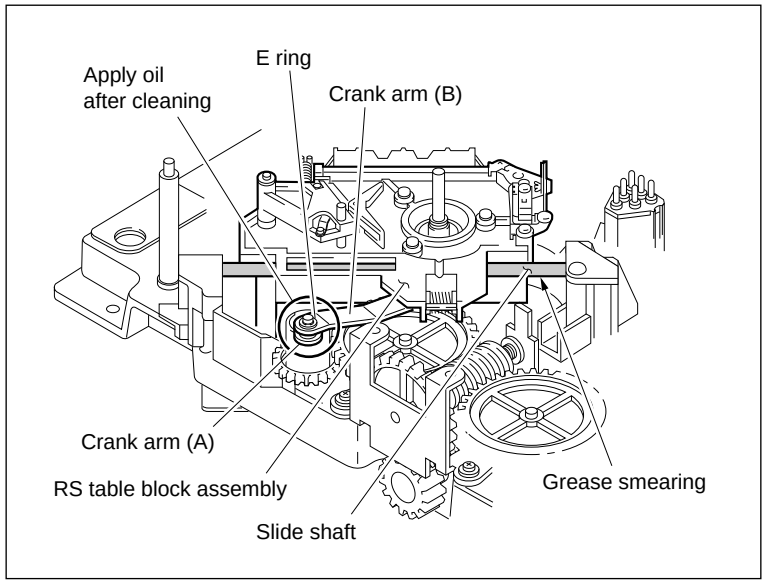
17. Attach the Crank Arm

(1) Clean the shaft of the crank arm (A) and apply one drop of oil to it.
(2) Confirm that the RS table block assembly is in the middle between S and L cassette positions.

Note

Attach the crank arm in the middle between S and L cassette positions for the adjustment of gear phase.

(3) Attach the crank arm (B) in the shaft of the crank arm (A) with the E ring.



Applying the Grease to Slide Shaft and Attach the Crank Arm

Adjustment after Replacement

18. Confirm the Reel Motor Shaft Slantness

Refer to Section 5-15-2.

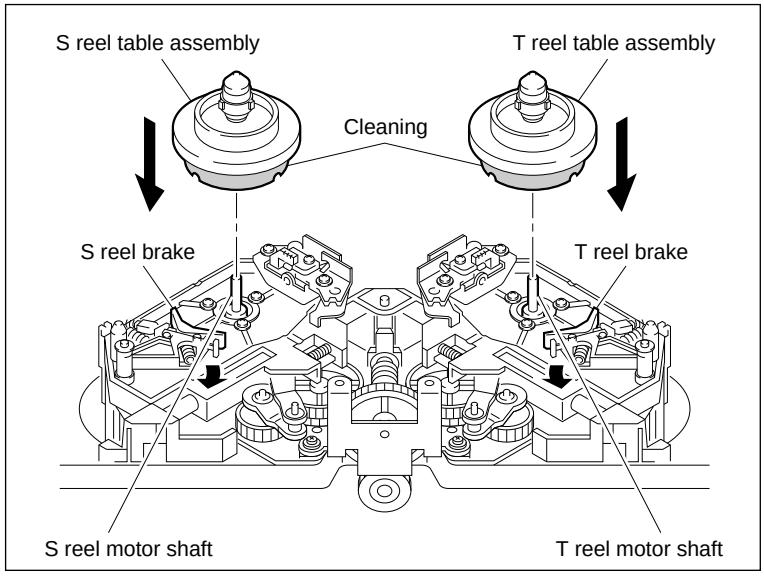
19. Attach the Reel Table Assembly

(1) Clean the circumference of the reel table assembly.

(2) While moving the reel brake in the direction indicated by the arrow to make free, pass the reel table assembly through the reel motor shaft.

Note

Tighten the two set screws of the reel table assembly after the reel table height confirmation is completed.



Attach the Reel Table Assembly

20. Confirm the Cassette Pillar Height

Refer to Section 5-15-3.

21. Confirm the Reel Table Height

Refer to Section 5-13-1.

22. Confirm the Reel Brake Clearance

Refer to Section 5-13-2.

23. Confirm the Reel Brake Release

Refer to Section 5-13-3.

24. Confirm the Brake Solenoid Operation

Refer to Section 3-2-2.
(C021: S REEL BRAKE,
C022: T REEL BRAKE)

5-17. Reel Shift Gear Replacement

Outline

Replacement

1. Remove the RS Table Block Assembly
   (Refer to steps 1 through 3 in Section 5-15-1.)
2. Remove the Reel Shift Gear
3. Remove the Crank Gear
4. Attach the Crank Gear
5. Attach the Reel Shift Gear
6. Apply the Grease (Warm Gear)
7. Attach the RS Table Block Assembly
   (Refer to steps 9 through 13 in Section 5-15-1.)
8. Confirm the Reel Shift Gear Operation

Adjustment after Replacement

9. Adjust the Cassette Pillar Height (Refer to Section 5-15-3.)

Notes

- This section describes the reel shift gear replacement. The replacement of the warm wheel, crank gear, and crank arm is also the same as for this replacement procedure.
- The steps 3 and 4 are not required when the reel shift gear or warm wheel is replaced.
- Use a new stop washer when the reel shift gear, warm wheel, crank gear, and crank arm are replaced.
  Stop washer (2.3): 3-669-596-00

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment assembly. (Refer to Section 1-5.)

Tools

- Oil: 7-661-018-18
- Grease (SGL-601): 7-651-000-10
- Cleaning fluid: 9-919-573-01
- Cleaning cloth: 3-184-527-01

Removal

1. Remove the RS Table Block Assembly

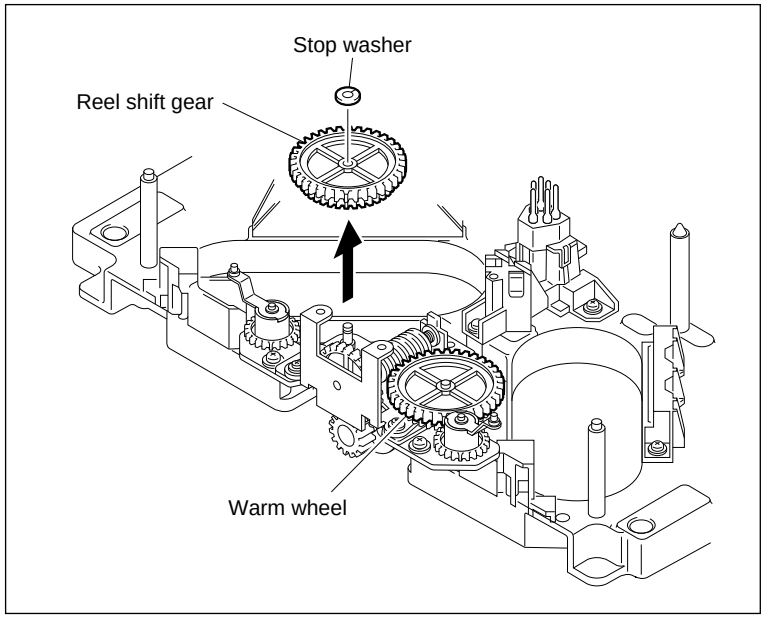
Remove the RS table block assembly with the reel table assembly attached.
(Refer to steps 1 through 3 in Section 5-15-1.)

2. Remove the Reel Shift Gear

Remove the stop washer, then remove the reel shift gear.

Note

Do not reuse the stop washer.



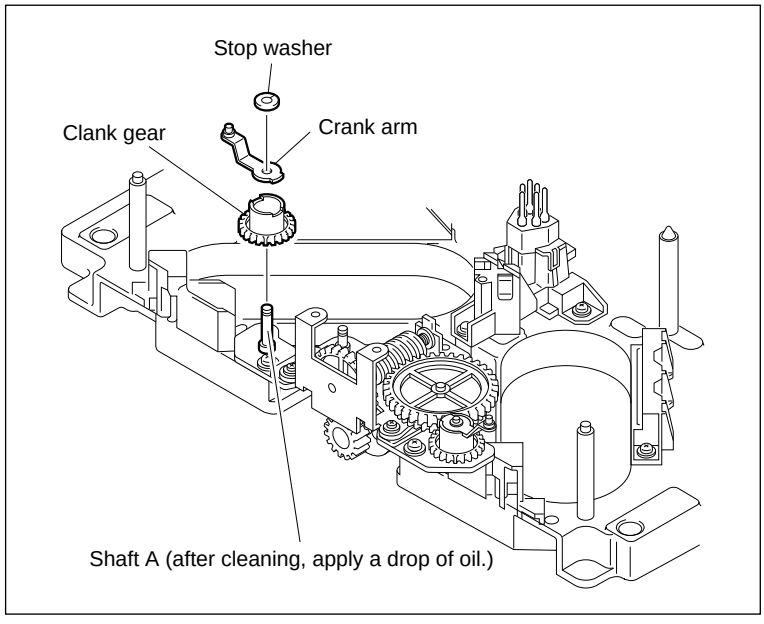
Remove the Reel Shift Gear

3. Remove the Crank Gear

(1) Remove the stop washer, then remove the crank gear.
(2) Take out the crank arm from the crank gear.

Note

Do not reuse the stop washer.



Remove/Install the Crank Gear

Installation

4. Attach the Crank Gear

(1) Clean shaft A.
(2) Apply one drop of oil to shaft A.
(3) Combine the crank arm with the crank gear.
(4) Pass the crank gear through the shaft A.
(5) Fix the crank gear with a new stop washer.

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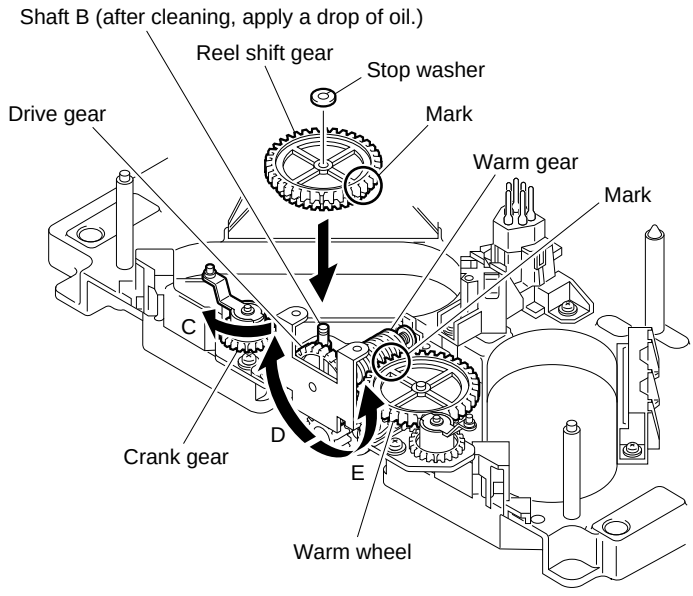
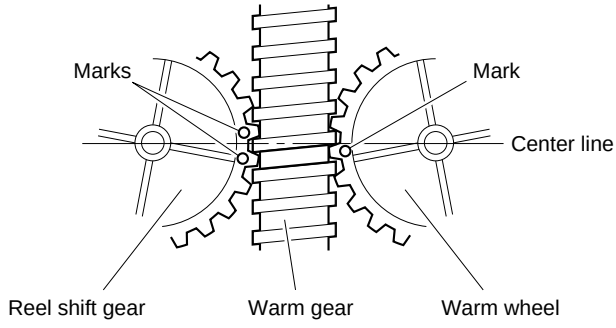
5. Attach the Reel Shift Gear

(1) Clean shaft B.
(2) Apply one drop of oil to shaft B.
(3) Turn the crank gear fully in the direction indicated by arrow C.
(4) Turn the drive gear and put the mark of the warm wheel in the illustrated position.
(5) Align the mark of the reel shift gear with that of the warm wheel and pass the reel shift gear through shaft B while engaging it with the warm gear and crank gear.
(6) Rotate the drive gear in the direction indicated by arrow D by three to five turns, then fully rotate it in the direction of arrow E. At that time, confirm that the reel shift gear and warm wheel satisfy the specification.
(7) Fix the reel shift gear with a new stop washer.





Spec. : The mark of the reel shift gear and the mark of the warm wheel are in the portion shown in the figure.

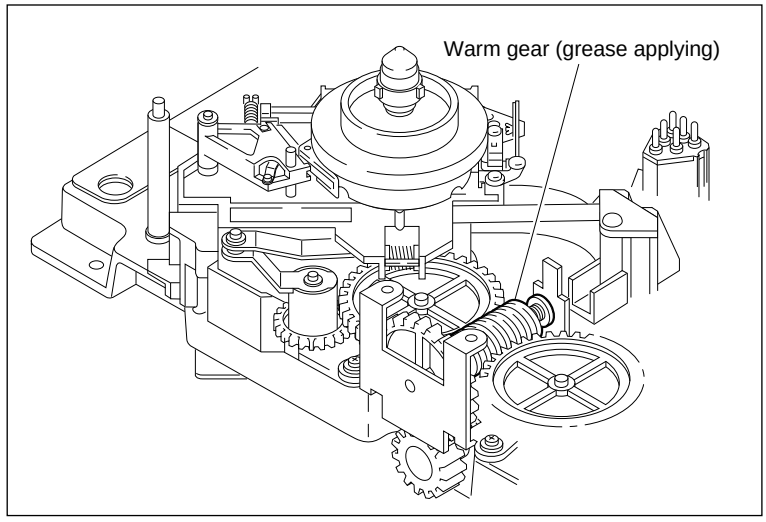
Attach the Reel Shift Gear

6. Apply the Grease

(1) Wipe the grease on the warm gear and clean it.
(2) Apply the grease to the warm gear.

7. Attach the RS Table Block Assembly

Refer to steps 9 through 13 in Section 5-15-1.



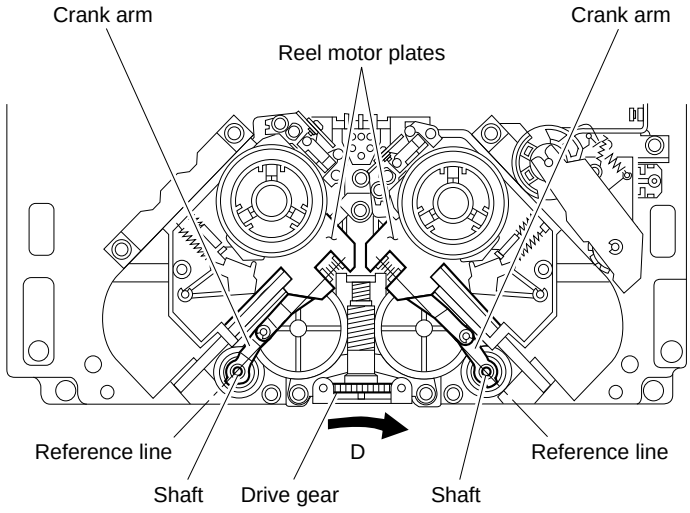
Apply the Grease

8. Confirm the Reel Shift Gear Operation

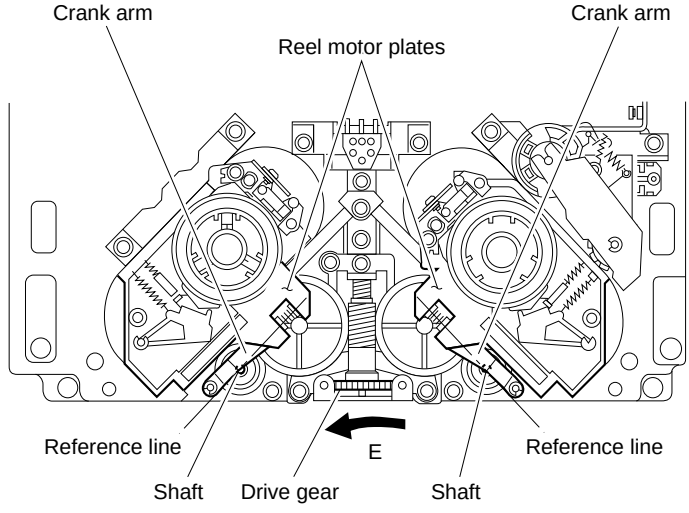
(1) Confirm that the crank arms on the supply and take-up sides operate in the same phase while turning the drive gear in the directions indicated by arrows D and E.

(2) Confirm that the crank arm is nearer to the reel motor plate than the reference line when the drive gear is rotated in the direction indicated by arrow D until it stops. (Fig. A) Similarly, confirm that the crank arm is nearer to the reel motor plate than the reference line when the drive gear is rotated in the direction indicated by arrow E until it stops. (Fig. B)

<Fig. A>



<Fig. B>



Confirm the Reel Shift Gear Operation

Adjustment after Replacement

9. Adjust the Cassette Pillar Height

Refer to Section 5-15-3.

5-18. Reel Shift Motor Replacement

Outline

Replacement

1. Remove the RS Table Block Assembly
   (Refer to steps 1 through 3 in Section 5-15-1.)
2. Remove the Reel Shift Assembly
3. Remove the M Gear
4. Remove the Reel Shift Motor
5. Remove the CCM-15 Board
6. Attach the CCM-15 Board
7. Attach the Reel Shift Motor
8. Attach the M Gear
9. Attach the Reel Shift Assembly
10. Apply the Grease (Warm Gear)
11. Attach the RS Table Block Assembly
    (Refer to steps 9 through 13 in Section 5-15-1.)

Adjustment after Replacement

12. Adjust the Cassette Pillar Height (Refer to Section 5-15-3.)
13. Check the Reel Shift Motor Operation (Refer to Section 3-2-2.)
    (C016: REEL SHIFT MOTOR)

Notes

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment assembly. (Refer to Section 1-5.)

Tools

- L wrench (Across flat has 0.89 mm): 7-700-736-06
- Torque screwdriver (6 kg•cm)(JB-5251): J-6252-510-A
- Torque screwdriver's hexagonal bit
  (Across flat has 0.89 mm, l = 50 mm): J-6323-440-A
- Thickness gauge: 9-911-053-00
- Grease (SGL-601): 7-651-000-10
- Oil: 7-661-018-18
- Locking compound : 7-432-114-11
- Cleaning fluid: 9-919-573-01
- Cleaning cloth: 3-184-527-01

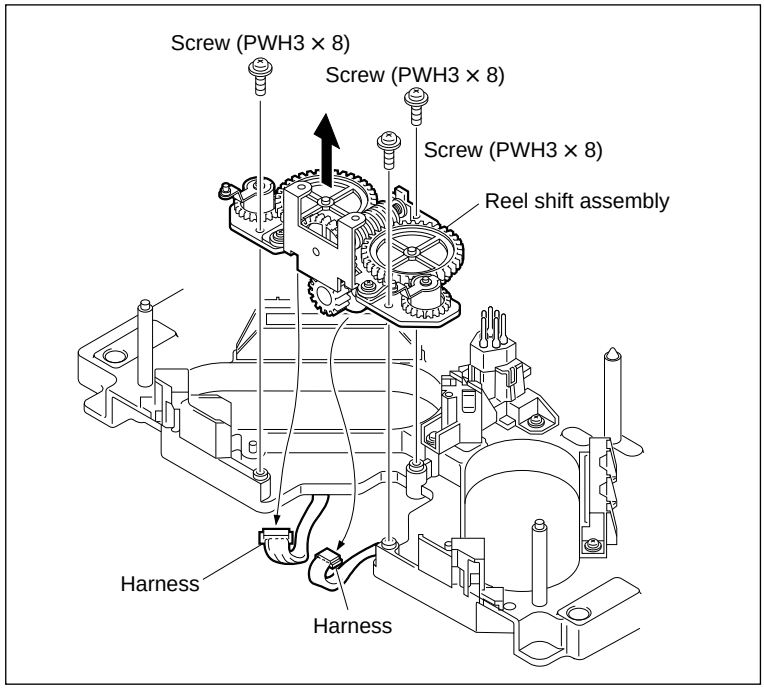
Removal

1. Remove the RS Table Block Assembly

Remove the RS table block assembly on the supply and take-up sides with the reel table assembly attached.
(Refer to steps 1 through 3 in Section 5-15-1.)

2. Remove the Reel Shift Assembly

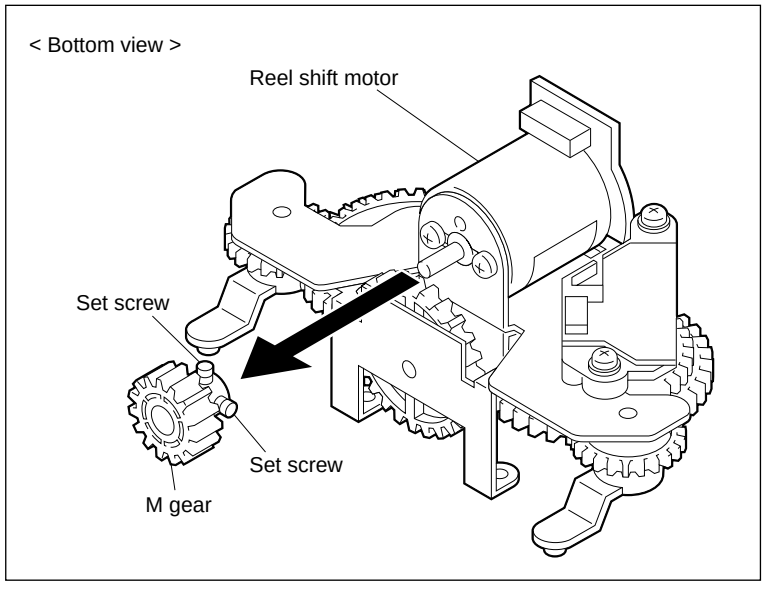
(1) Remove the three screws.
(2) Raise the reel shift assembly and disconnect the two harnesses shown in the figure.



Remove the Reel Shift Assembly

3. Remove the M Gear

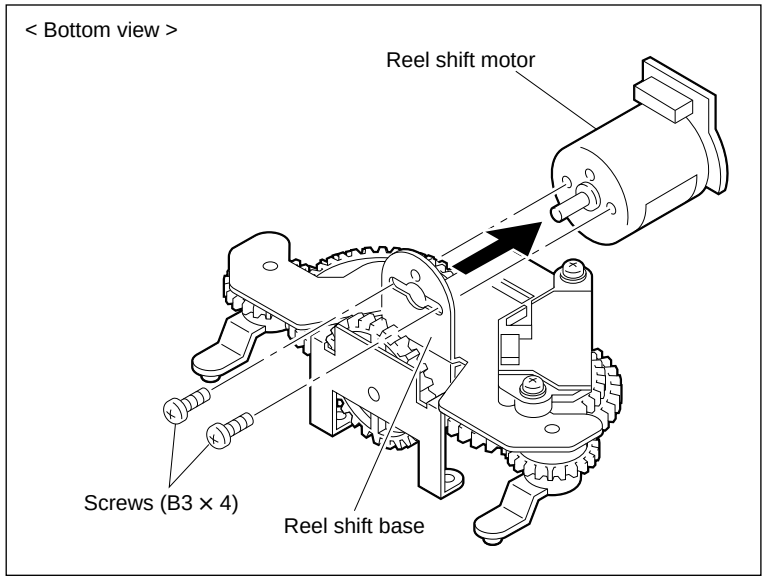
(1) Loosen the two set screws shown in the figure.
(2) Pull out the M gear from the shaft.



Remove the M Gear

4. Remove the Reel Shift Motor

Remove the two screws, then remove the reel shift motor from the reel shift base.



Remove the Reel Shift Motor

5. Remove the CCM-15 Board

Unsolder and remove the CCM-15 board from the reel shift motor.

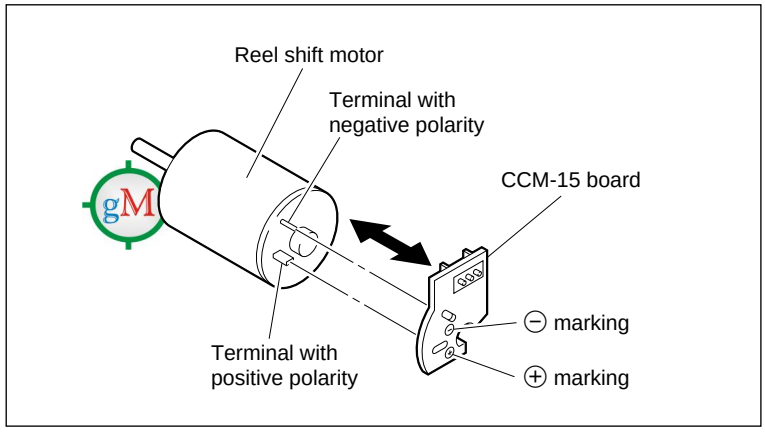
Installation

6. Attach the CCM-15 Board

Pass the terminals of a new motor through the CCM-15 board, then solder.

Note

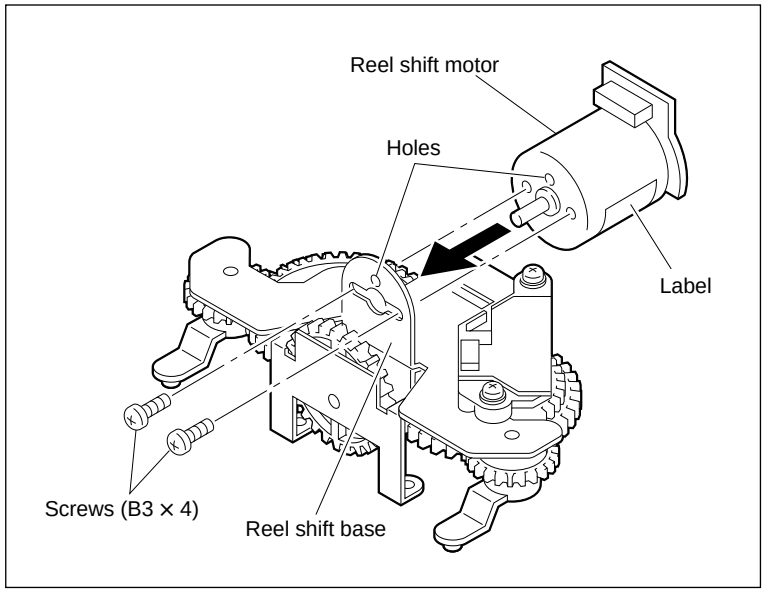
Solder so that no clearance exists between the motor and CM-15 board.



Remove/Attach the CCM-15 Board

7. Attach the Reel Shift Motor

(1) Align the position of the reference hole of the motor with that of the reel shift base and tighten the two screws.
(2) Slightly apply the locking compound to the screws.



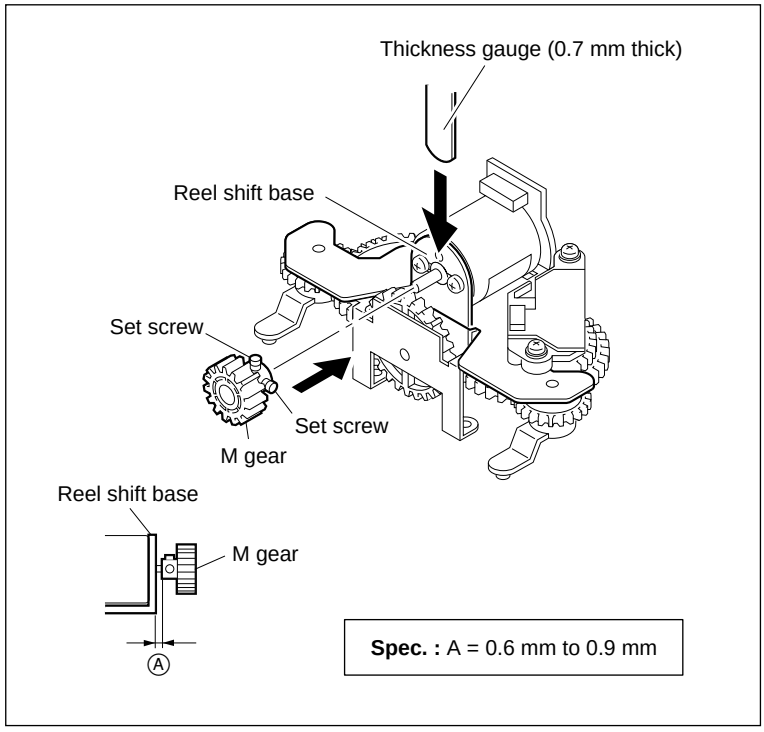
Attach the Reel Shift Motor

8. Attach the M Gear

(1) Pass the M gear through the shaft of the motor.
(2) Put a thickness gauge (0.7 mm thick) between the M gear and reel shift base.
(3) Tighten the two set screws while pushing the M gear toward the reel shift base.

Tightening torque: 18.6×10^{-2} N • m
{1.9 kgf • cm}

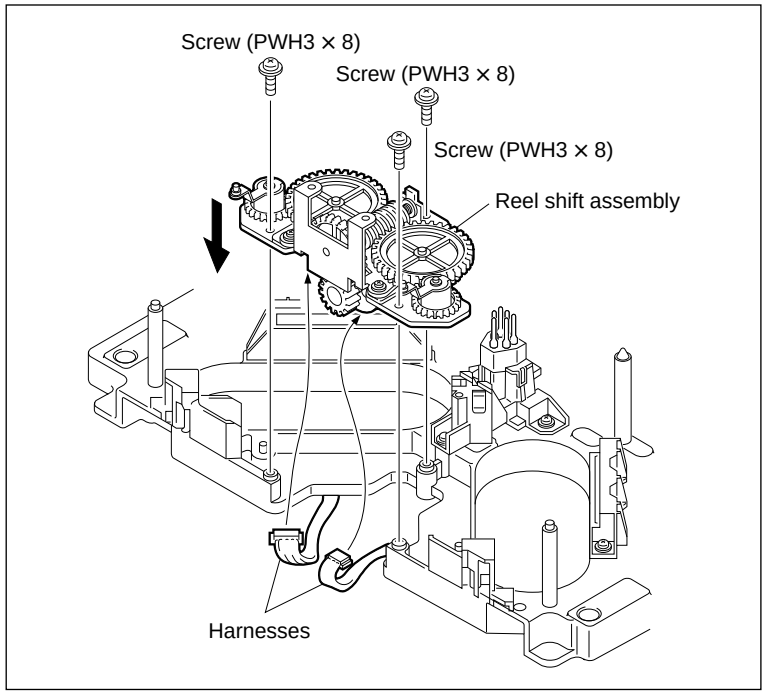
(4) Pull out the thickness gauge.
(5) Confirm that the clearance between the M gear and reel shift base satisfies the specification when the M gear is pushed toward the reel shift base.



Attach the M Gear

9. Install the Reel Shift Assembly

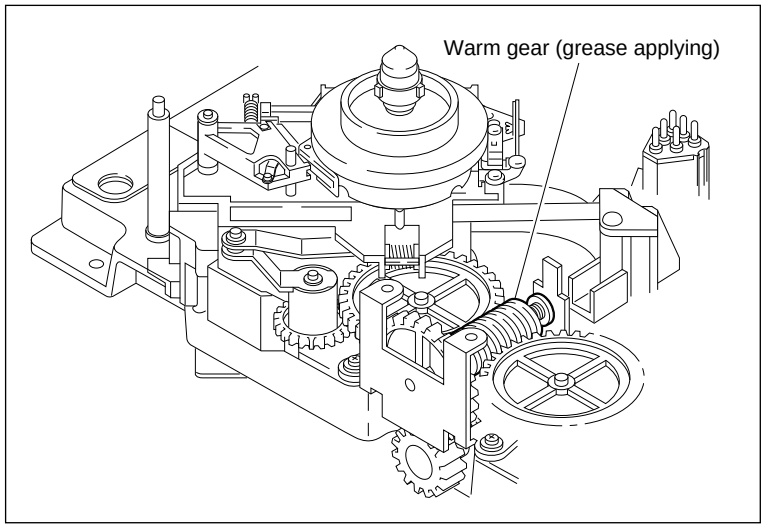
(1) Connect the two harnesses disconnected in step 2 to the reel shift assembly.
(2) Tighten the three screws.



Attach the Reel Shift Assembly

10. Apply the Grease

(1) Wipe the grease on the warm gear and clean it.
(2) Apply the grease to the warm gear.



Apply the Grease

11. Attach the RS Table Block Assembly

Refer to steps 9 through 13 in Section 5-15-1.

Adjustment after Replacement

12. Confirm the Cassette Pillar Height

Refer to Section 5-15-3.

13. Check the Reel Shift Motor Operation

Refer to Section 3-2-2.
(C016: REEL SHIFT MOTOR)

5-19. Tape Guide Replacement

Note

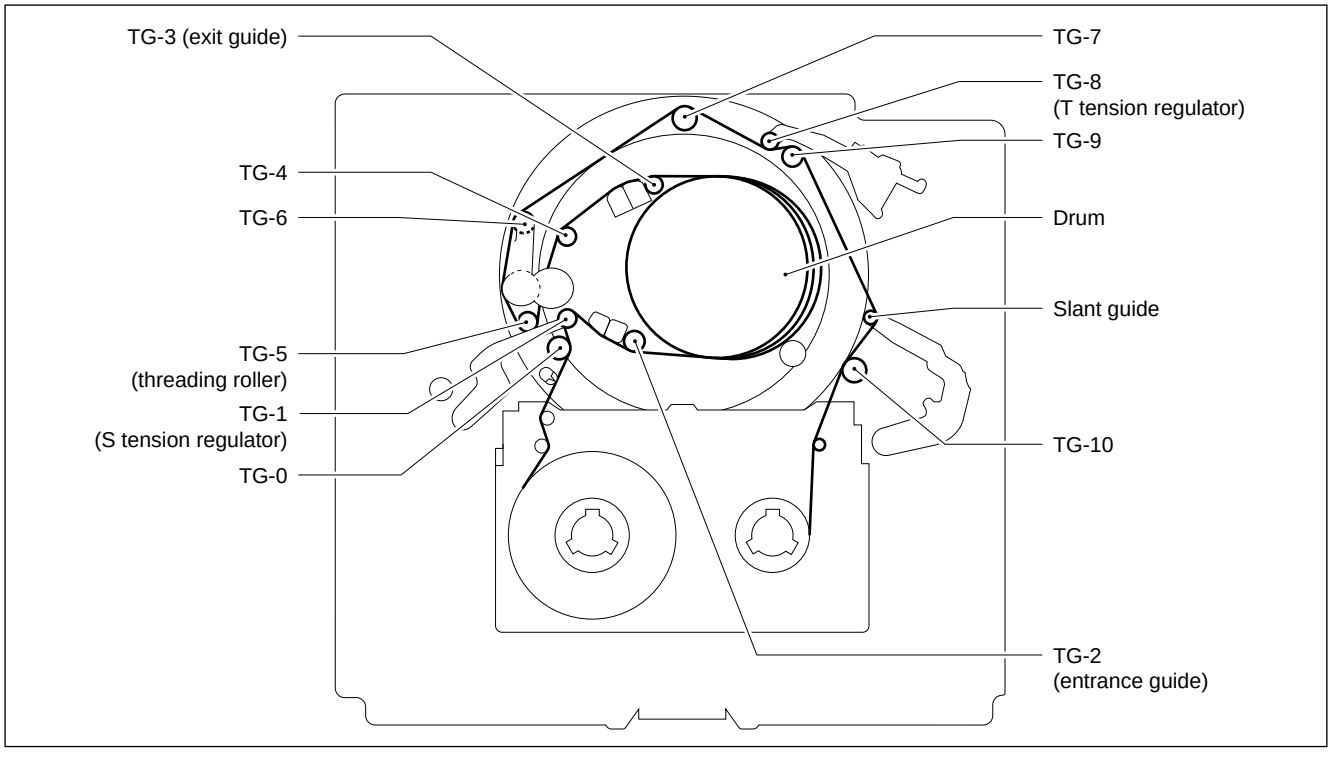
Be careful not to damage the drum when the tape guide roller is replaced.

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment assembly. (Refer to Section 1-5.)

Replacement

Perform the part replacement while referring to the exploded view.



Adjustment after Replacement

- Perform the following adjustments when any tape guide is replaced.
  ① Tape-running adjustment (Refer to Section 6-1-2.)
  ② Video tracking confirmation (Refer to Section 6-1-3.)

- Perform the following adjustments when the slant guide is replaced.
  ① Slant guide slantness adjustment (Refer to Section 5-25-2.)
  ② Tape-running adjustment (Refer to Section 6-1-2.)
  ③ Video tracking confirmation (Refer to Section 6-1-3.)

- Perform the following adjustments when the TG-2 or TG-3 is replaced.
  RF switching position adjustment
  (Refer to Section 3-2-5.)
  (A011: RF SWITCHING POS.)
  (A012: NV-RAM CONTROL)

5-20. Tape Cleaner Replacement

CAUTION

The tape cleaner has a sharp edge. Pay careful attention when handling the tape cleaner. Never touch it with bare hands.

Outline

Replacement

1. Remove the Tape Cleaner
2. Attach the Tape Cleaner

Note

The adjustment after tape cleaner replacement is not required.

Tools

- Torque screwdriver (6 kg•cm)(JB-5251): J-6252-510-A
- Torque screwdriver's bit (+2 mm, l = 75 mm): J-6323-420-A

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment assembly. (Refer to Section 1-5.)

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Removal

1. Remove the Tape Cleaner

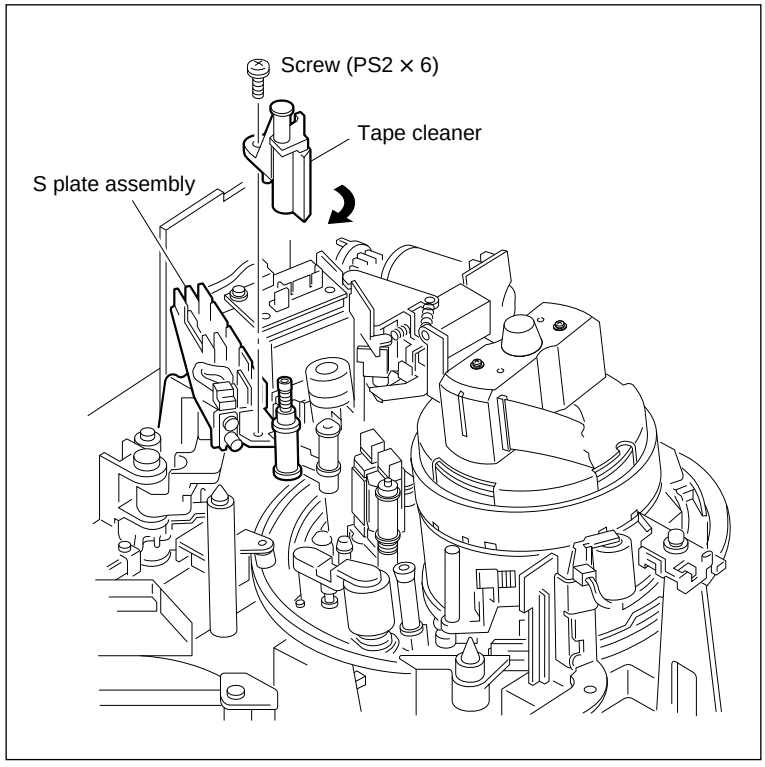
Remove the screw, then remove the tape cleaner from the S plate assembly.

Installation

2. Attach the Tape Cleaner

Tighten the screw while moving a new tape cleaner clockwise.

Tightening torque: 19.6×10^{-2} N • m
{20 kgf • cm}



Remove/Attach the Tape Cleaner

5-21. Gear Box Assembly and Threading Motor Replacement

Outline

Replacement

1. Remove the Bottom Plate
2. Remove the Shield Plate (Bottom)
3. Remove the DR-315 Board
4. Disconnect the Harnesses
5. Remove the Gear Box Assembly
6. Remove the Threading Motor
7. Remove the CCM-15 Board
8. Attach the CCM-15 Board
9. Attach the Threading Motor
10. Attach the Gear Box Assembly
11. Connect the Harnesses
12. Attach the DR-315 Board
13. Attach the Shield Plate (Bottom)
14. Attach the Bottom Plate

Adjustment after Replacement

15. Confirm the Threading Motor Operation (Refer to Section 3-2-2.)
    (C012: THREADING MOTOR)

Notes

- The gear box assembly supplied as repair parts may differ in two harness length from one used in this unit because of standardization of repair parts. When replacing the gear box assembly, replace the two harnesses by ones used in this unit according to the procedure described in this section.
- The threading motor, CCM-15 board, and gear box assembly can be replaced according to the procedure described in this section. Perform all the steps when the threading motor or CCM-15 board is replaced. Perform the steps 1 through 5 and 10 through 15 when the gear box assembly is replaced.

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment assemby. (Refer to Section 1-5.)

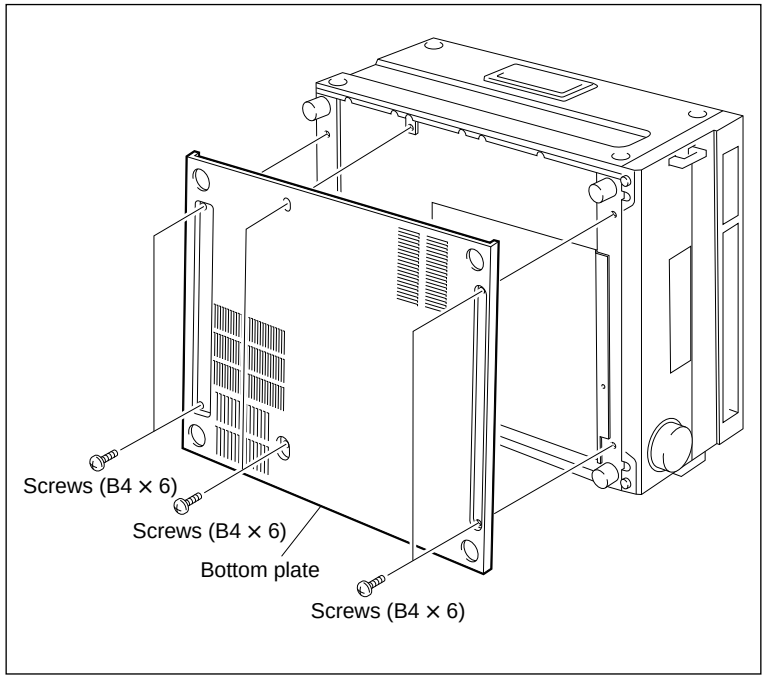
Tools

- L wrench (Across flat has 1.27 mm): 7-700-736-01
- Locking compound: 7-432-114-11
- Thickness gauge: 9-911-053-00

Removal

1. Remove the Bottom Plate

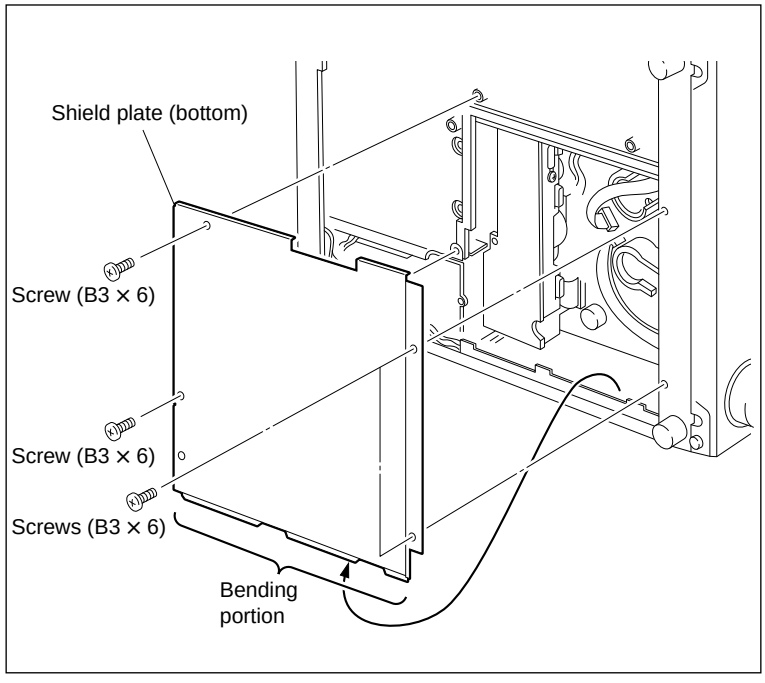
(1) Place the unit on its right side panel down.
(2) Remove the six screws and remove the bottom plate.



Remove the Bottom Plate

2. Remove the Shield Plate (Bottom)

Remove the four screws, and then the shield plate (bottom).



Remove the Shield Plate (Bottom)

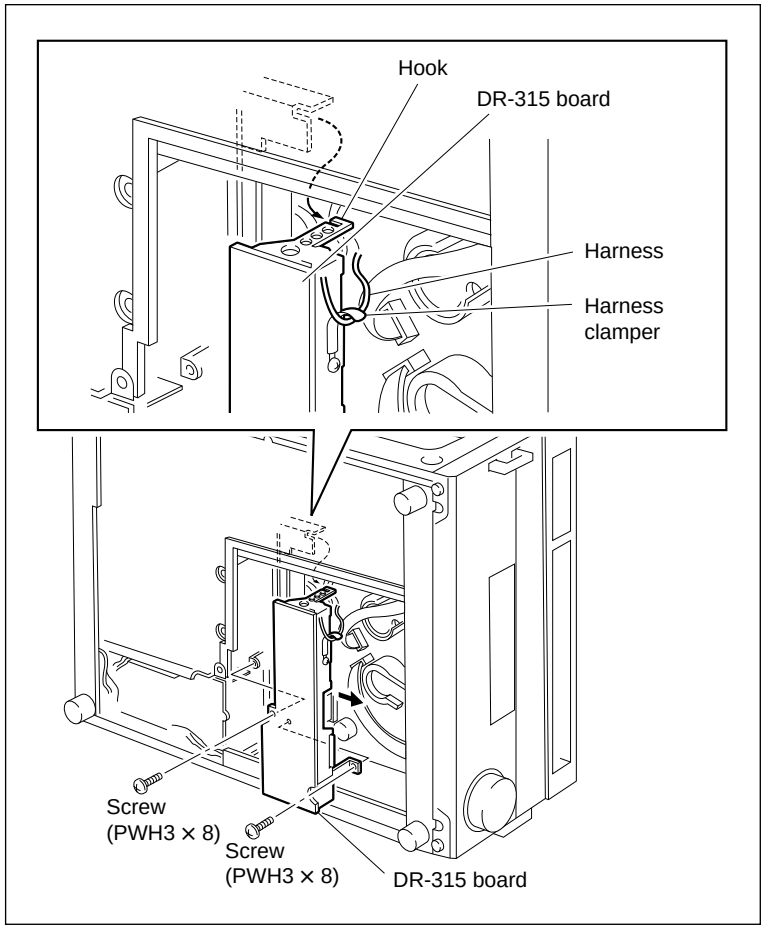
3. Remove the DR-315 Board

(1) Stretch the harness clamper on the DR-315 board and release the harnesses.
(2) Remove the two screws shown in the figure.
(3) Move the DR-315 board toward the reel motors, and detach the hook.

Note

The hook is difficult to view because it is located in the inner part.

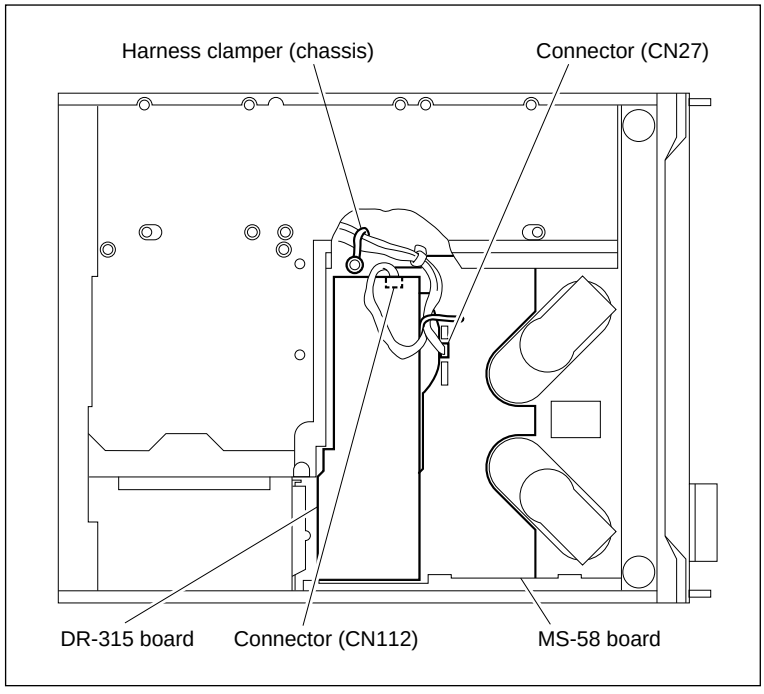
(4) Pull out the DR-315 board as far as possible as shown in the figure.



Remove the DR-315 Board

4. Disconnect the Harnesses

(1) Strech the harness clamper (chassis) shown in the figure.
(2) Disconnect the harness from the connector CN112 on the DR-315 board.
(3) Disconnect the harness from the connector CN27 on the MS-58 board.



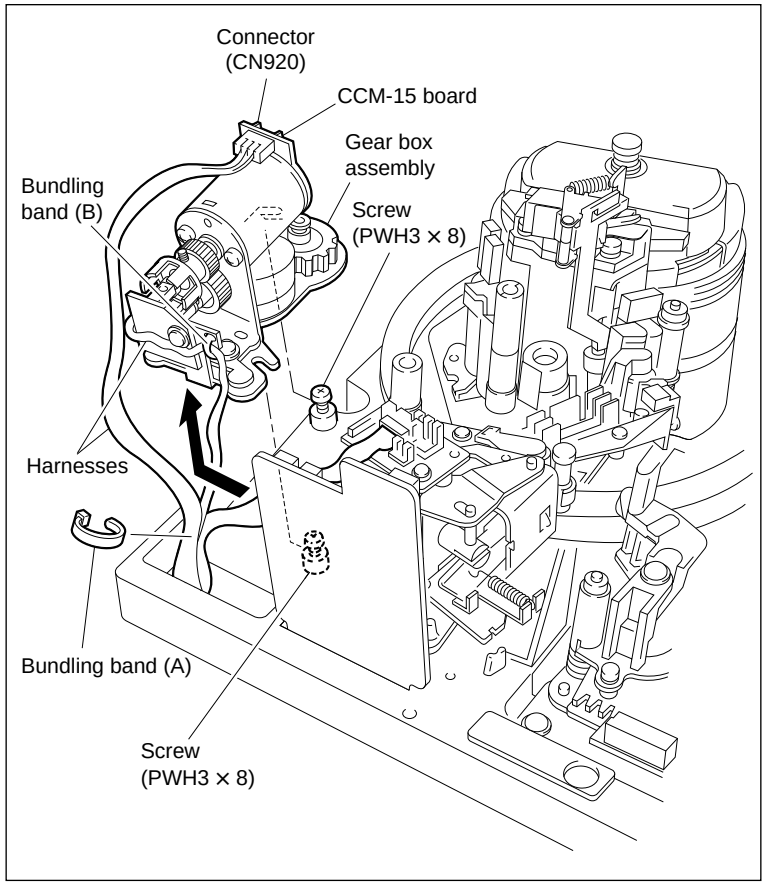
Disconnect the Harness

5. Remove the Gear Box Assembly

(1) Cut off the bundling band (A) shown in the figure.
(2) Loosen the two screws and remove the gear box assembly.
(3) Cut off the bundling band (B) shown in the figure.
(4) Disconnect the two harnesses from the gear box assembly.

Note

The steps 6 through 9 are not required when the gear box assembly is replaced.



Remove the Gear Box Assembly

6. Remove the Threading Motor

(1) Loosen the set screw of the M gear.
(2) Remove the two screws fixing the motor.

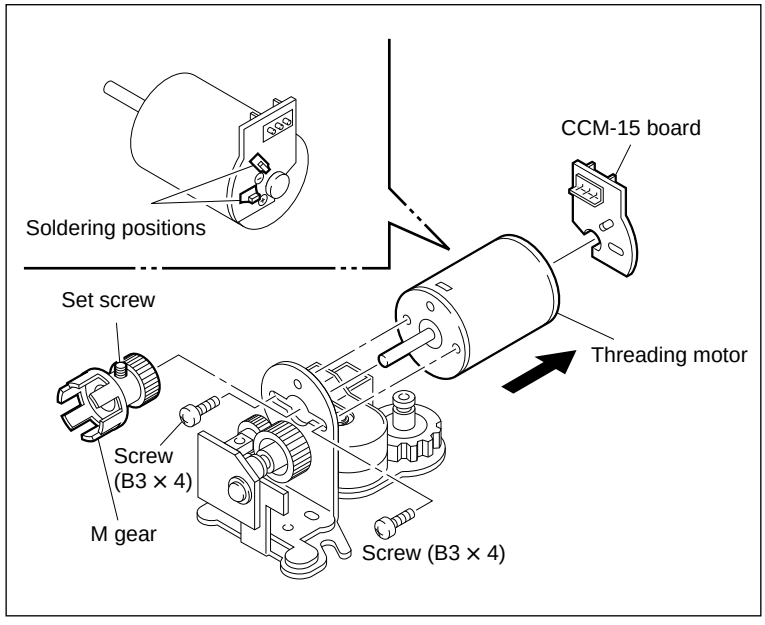
Note

Take care that the screwdriver does not strike against the M gear.

(3) Remove the motor. (The M gear can also be removed simultaneously.)

7. Remove the CCM-15 Board

Unsolder and remove the CCM-15 board.



Remove the Threading Motor and CCM-15 Board

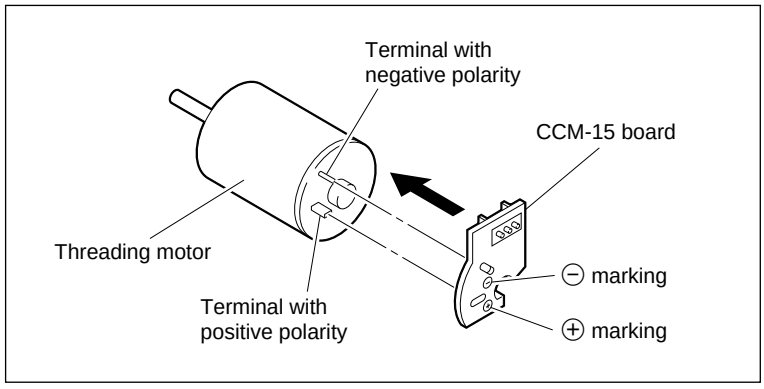
Installation

8. Attach the CCM-15 Board

Pass the pins of the threading motor through the CCM-15 board and solder them.

Note

Solder so that no clearance exists between the motor and CCM-15 board.



Attach the CCM-15 Board

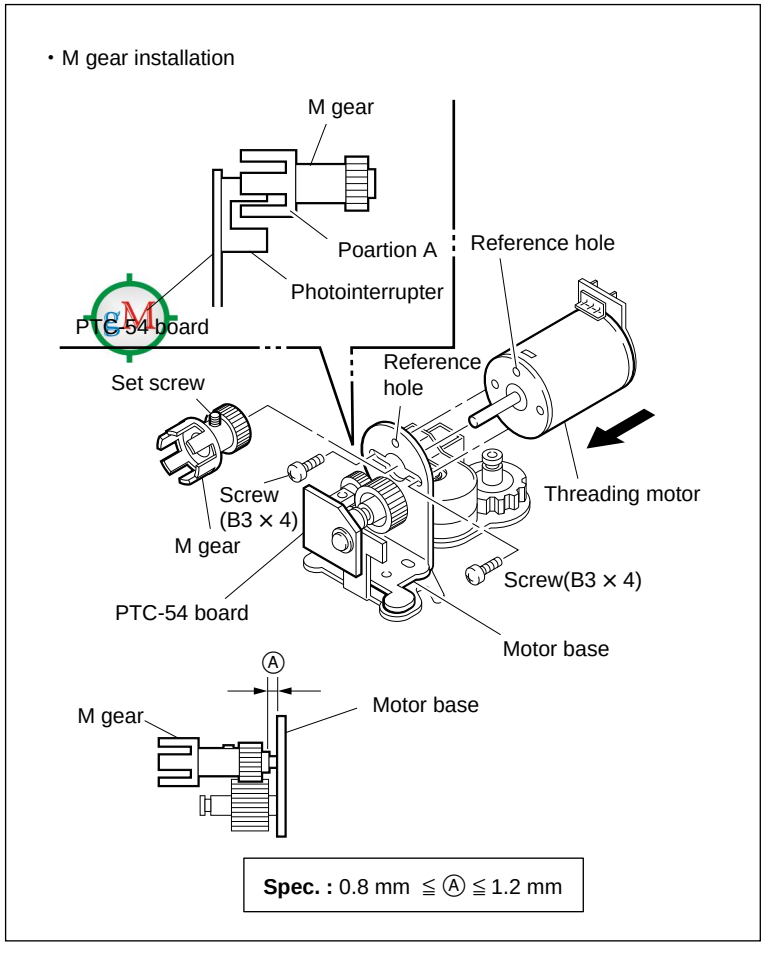
9. Attach the Threading Motor

(1) Put portion A of the M gear into the photointerrupter on the PTC-54 board.
(2) Pass the motor shaft through the hole of the motor base and align the reference hole position of the motor with that of the motor base.
(3) Slightly apply the locking compound to the motor fixing screws and tighten them.

Note

Take care that the screwdriver does not strike against the M gear.

(4) Put the thickness gauge (1.0 mm thick) between the M gear and motor base.
(5) Tighten the set screw while slightly pushing the M gear toward the motor base.
(6) Pull out the thickness gauge.
(7) Confirm that the clearance between the M gear and motor base satisfies the specification when the M gear is pushed toward the motor base.
(8) Confirm that the M gear smoothly rotates when manually rotating the M gear. Moreover, confirm that the M gear does not touch the photointerrupter.



Attach the Threading Motor

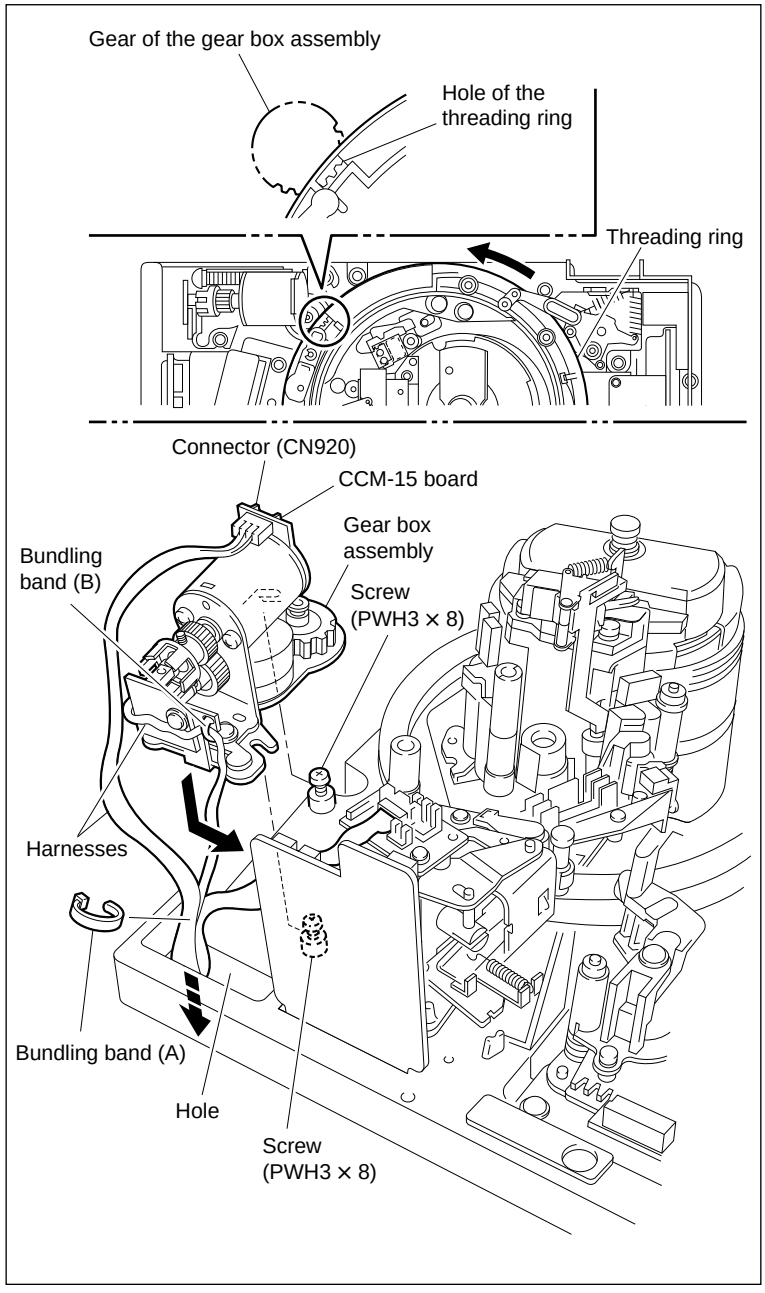
10. Attach the Gear Box Assembly

(1) Disconnect the two harnesses from a new gear box assembly.
(2) Connect the two harnesses in (4) of step 6 to a new gear box assembly.
(3) Bundle the harness released in (3) of step 6 with a new bundling band (B) (or the equivalent).
(4) Rotate the threading ring so that the pinch roller places in front of the pinch solenoid.

Note

Move the hole of the threading ring to confirm the engagement of the gear when the gear box assembly is attached.

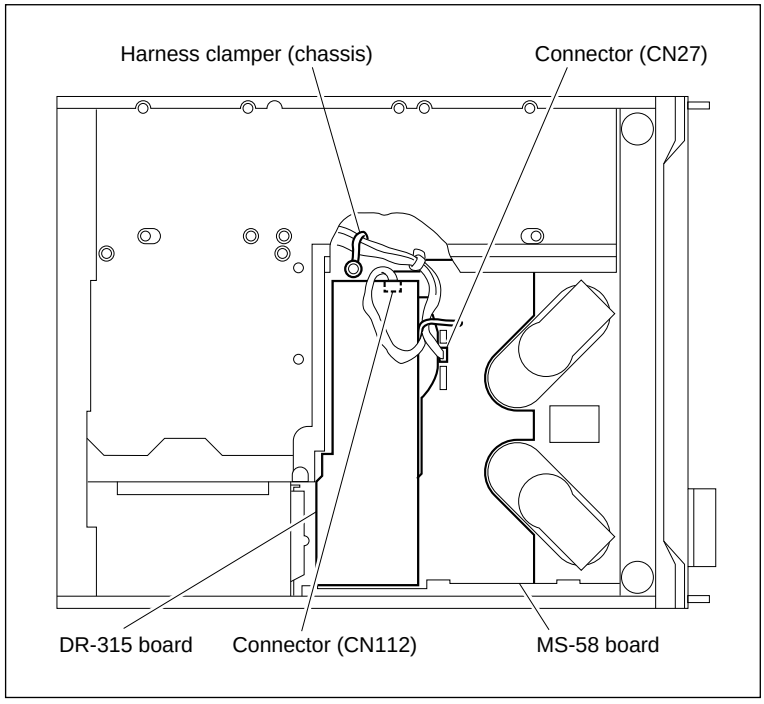
(5) Push the gear of the gear box assembly against that of the threading ring.
(6) Confirm from the hole of the threading ring that the gear of the gear box assembly engages with that of the threading ring.
(7) Tighten the screws while slightly pushing the gear box assembly toward the threading ring.
(8) Pass the two harnesses of the gear box assembly through the rear side from the hole of the mechanical deck, and put them to the rear side of the mechanical deck.
(9) Bundle the harnesses with a new the bundling band (A) (or the equivalent).



Attach the Gear Box Assembly

11. Connect the Harnesses

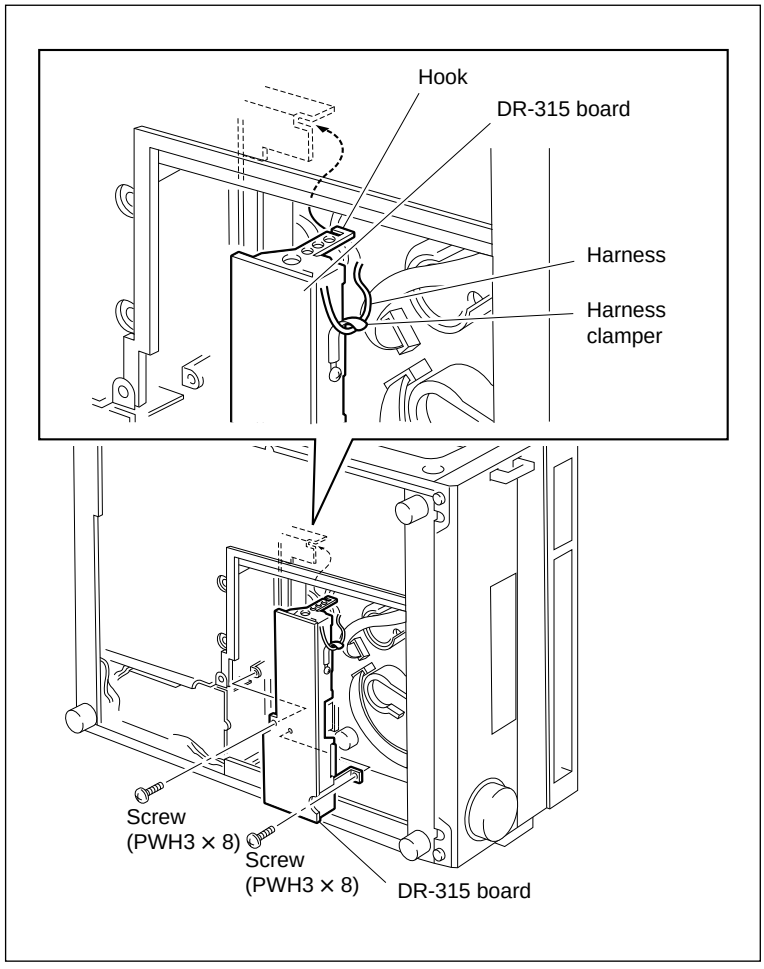
(1) Connect the harness (3-pin) to the connector CN27 on the MS-58 board.
(2) Connect the harness (2-pin) to the connector CN112 on the DR-315 board.
(3) Fix the two harnesses with the harness clamper (chassis).



Connect the Harnesses

12. Attach the DR-315 Board

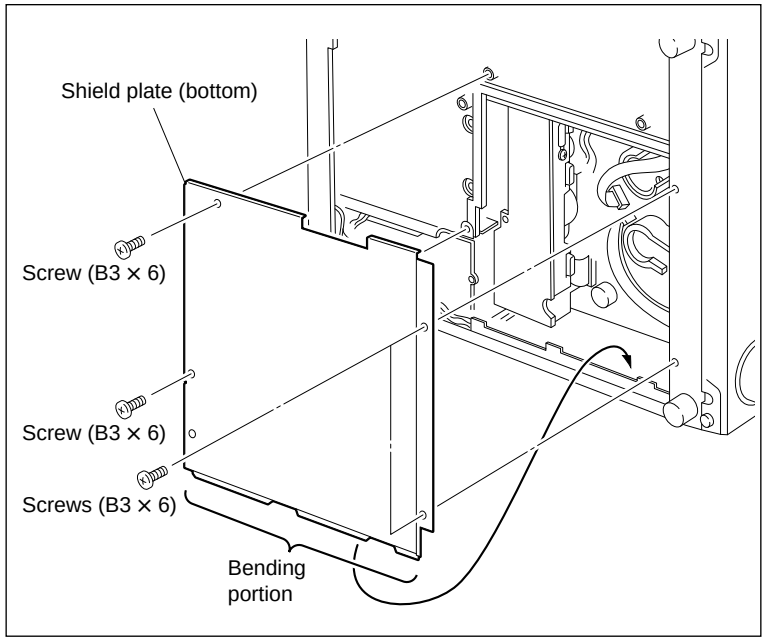
(1) Put the hook of the DR-315 board into the notch of the chassis shown in the figure.
(2) Fix the DR-315 board with the two screws.
(3) Clamp the harness released on (1) of step 3.



Attach the DR-315 Board

13. Attach the Shield Plate (Bottom)

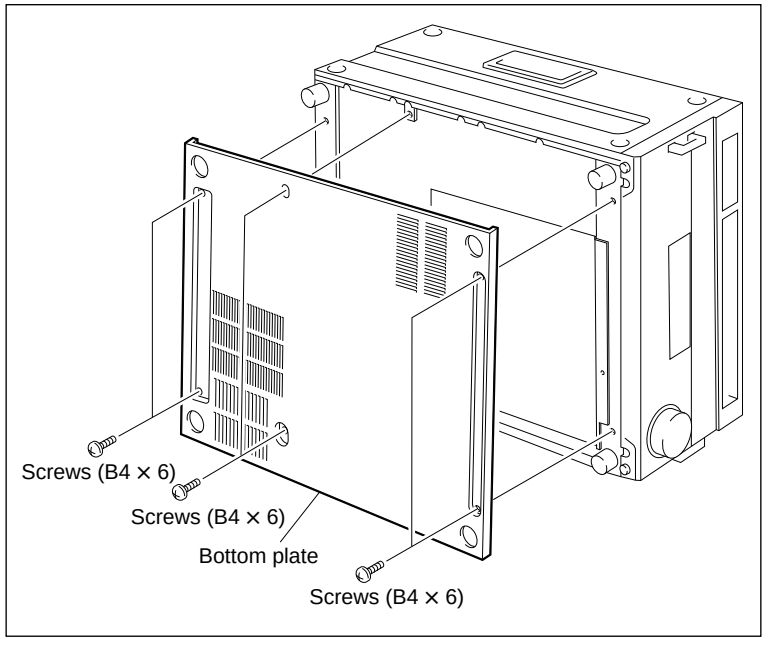
Attach the shield plate (bottom) with four screws.



Attach the Shield Plate (Bottom)

14. Attach the Bottom Plate

Attach the bottom plate with six screws.



Attach the Bottom Plate

Adjustment after Replacement

15. Confirm the Threading Motor Operation

Refer to Section 3-2-2.
(C012: THREADING MOTOR)

5-22. Threading Ring and Ring Roller Replacement

Outline

Replacement

1. Disconnect the Flexible Board (CN2/SE-461 Board)
2. Disconnect the Harness (AT Head Board)
3. Remove the Pinch Arm Guard
4. Remove the CL Guide Rail
5. Remove the Pinch Pressure Assembly
6. Remove the S Plate Assembly
7. Remove the S Tension Regulator Assembly
8. Remove the T Drawer Assembly
9. Remove the Gear Box Assembly (Refer to steps 1 through 5 in Section 5-21.)
10. Remove the Ring Rollers
11. Remove the Threading Ring Assembly
12. Attach the Ring Rollers (A) and (C)
13. Cleaning (Threading Ring Assembly)
14. Attach the Threading Ring Assembly
15. Attach the Ring Roller (B)
16. Attach the Gear Box Assembly (Refer to setps 10 through 15 in Section 5-21.)
17. Confirm the Threading Ring Operation
18. Attach the S Plate Assembly
19. Attach the Pinch Pressure Assembly
20. Put the Unit into the Unthreading End State
21. Attach the S Tension Regulator Assembly
22. Attach the T Drawer Assembly
23. Confirm the T Drawer Assembly Operation
24. Attach the CL Guide Rail
25. Confirm the CL Arm Assembly Operation
26. Attach the Pinch Arm Guard
27. Connect the Flexible Board (CN2/SE-461 Board)
28. Connect the Harness (AT Head Board)
29. Perform the Pinch Pressure Clearance Adjustment (Refer to Section 5-11-2.)
30. Confirm the Tape Running (Refer to Section 6-1-2.)

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment assembly. (Refer to Section 1-5.)

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

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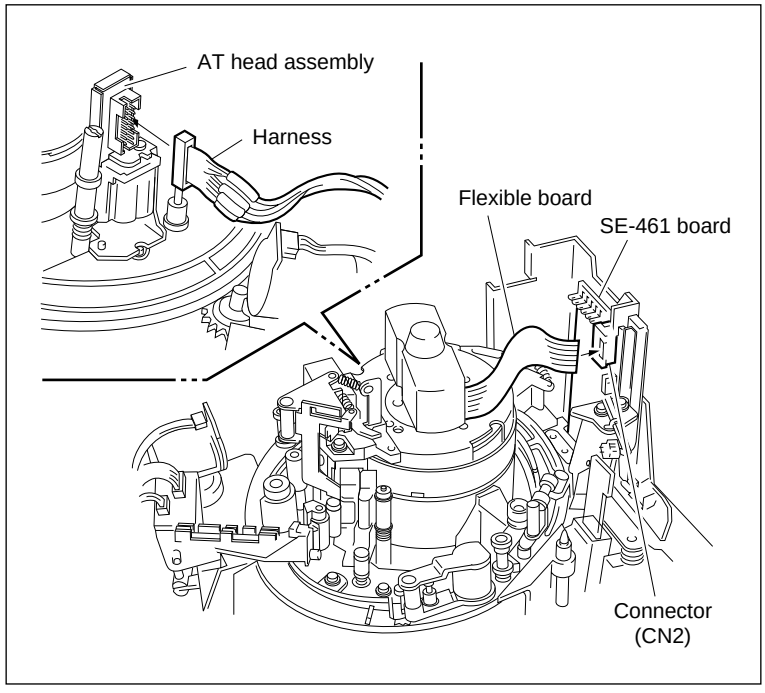
Removal

1. Disconnect the Flexible Board

Disconnect the flexible board from the connector CN2 on the SE-461 board.

2. Disconnect the Harness

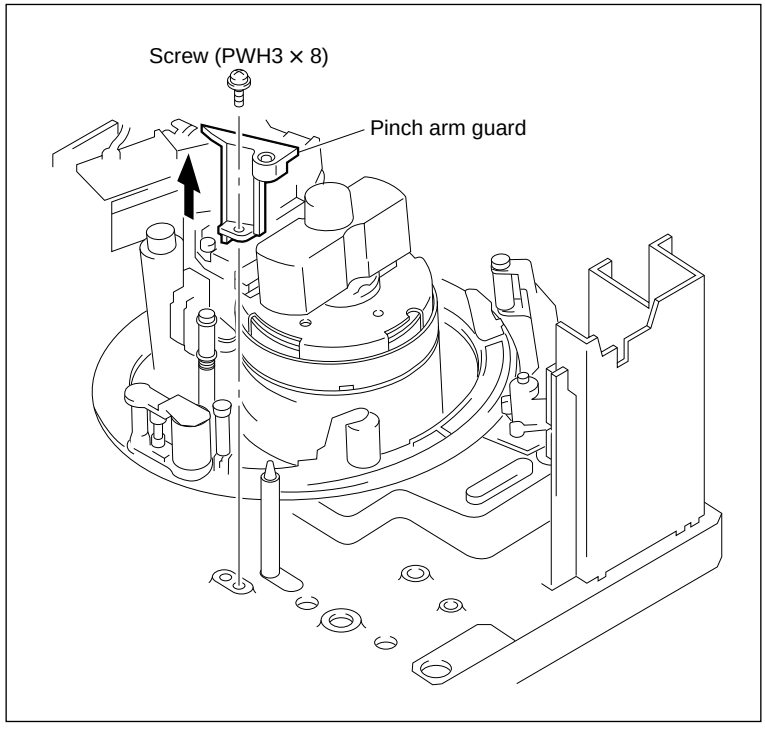
Disconnect the harness from the connector on the AT head assembly.



Disconnect the Flexible Board and Harness

3. Remove the Pinch Arm Guard

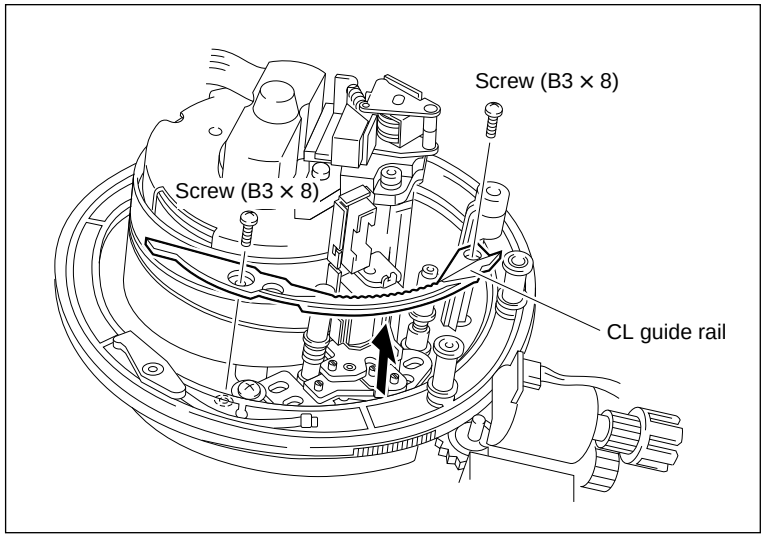
Remove the screw, then remove the pinch arm guard.



Remove the Pinch Arm Guard

4. Remove the CL Guide Rail

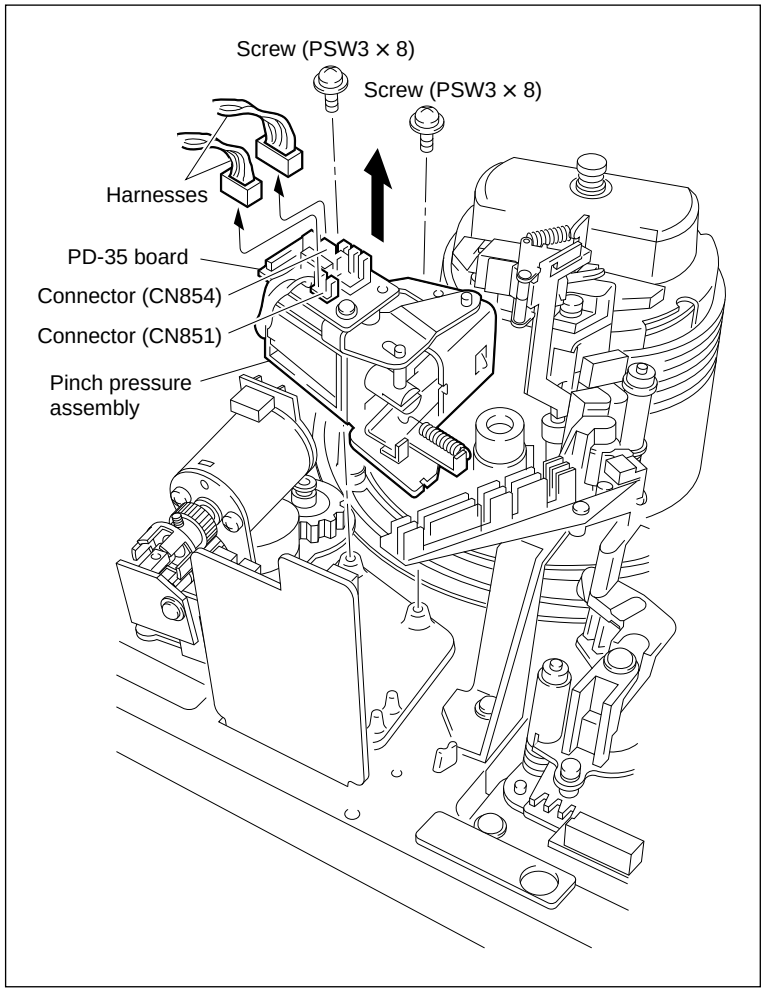
Remove the screws, then remove the CL guide rail.



Remove the CL Guide Rail

5. Remove the Pinch Pressure Assembly

(1) Disconnect the two harnesses from the connector CN851 and CN854 on the PD-35 board.
(2) Remove the two screws, then remove the pinch pressure assembly.



Remove the Pinch Pressure Assembly

6. Remove the S Plate Assembly

(1) Remove the bundling band and disconnect the harness from the connector CN200 on the TC-102 board.

(2) Remove the bundling band and disconnect the harnesses from the connectors on the CTL head board and the full-erase head board.

(3) Unhook each harness (CTL head, cleaning roller, and tape end sensor) from the sensor holder.

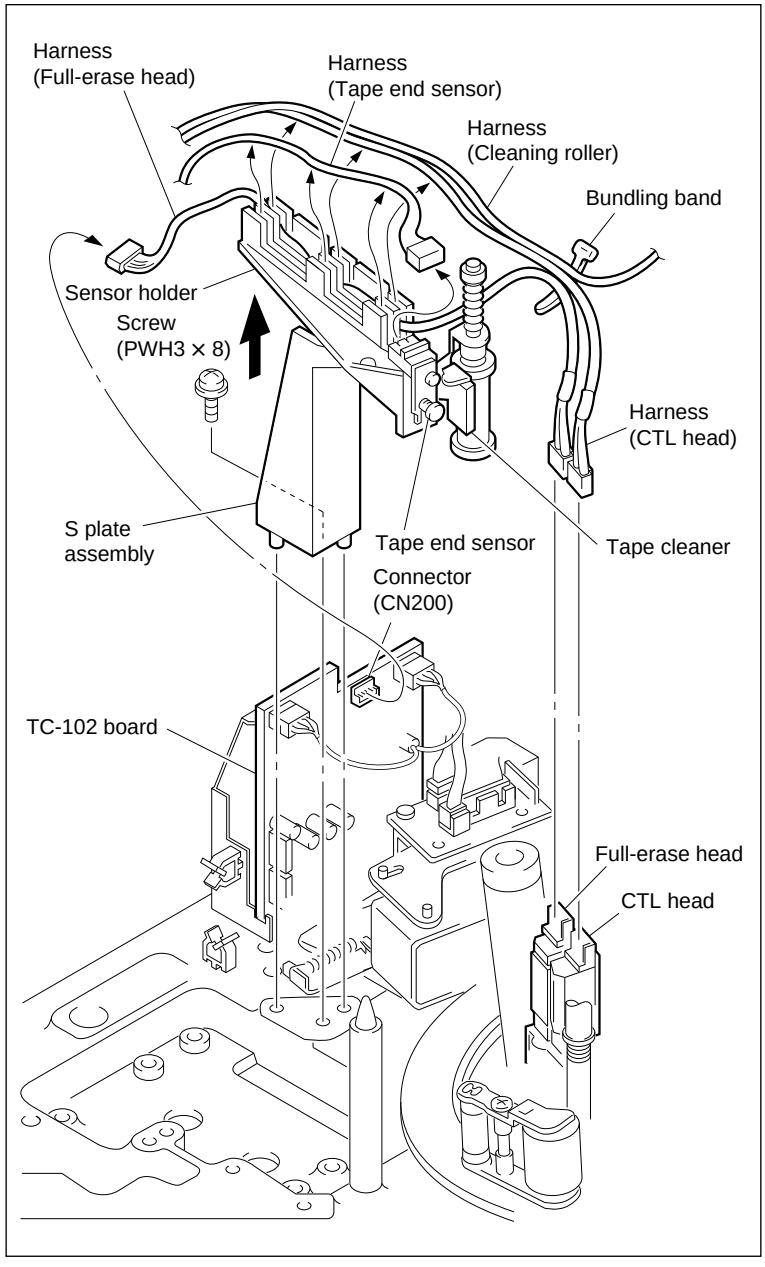
Note

Nover unhook the harness for full-erase head from the sensor holder.

(4) Remove the screw, then remove the S plate assembly.

CAUTION

The tape cleaner has a sharp edge. Pay careful attention when handling the tape cleaner.

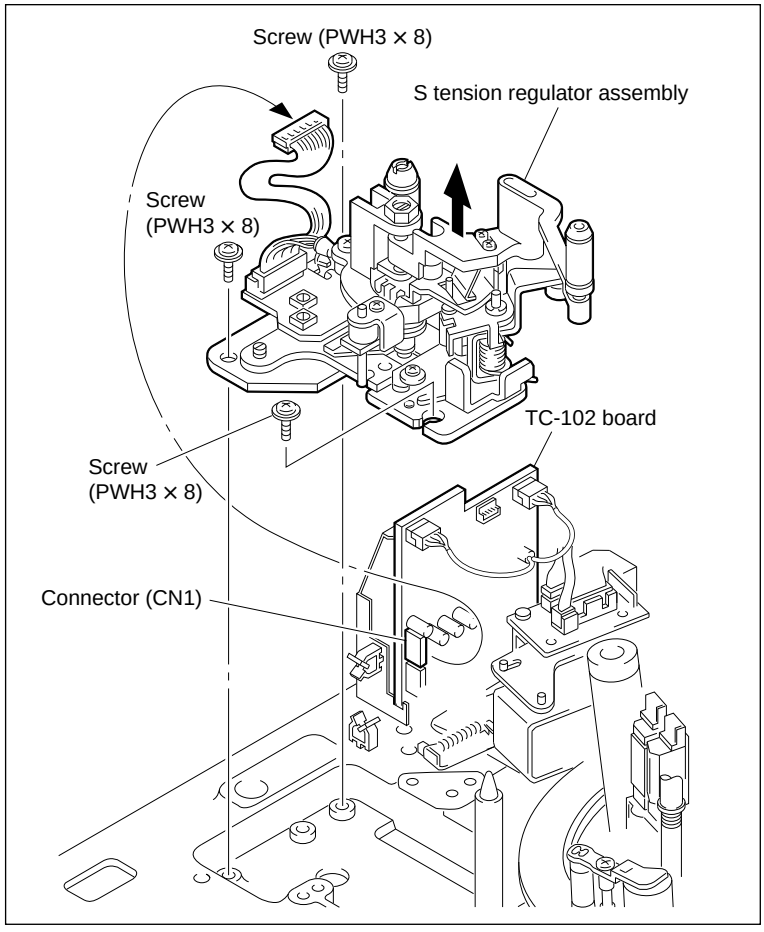


Remove the S Plate Assembly

7. Remove the S Tension Regulator Assembly

(1) Disconnect the harness from the connector CN1 on the TC-102 board.

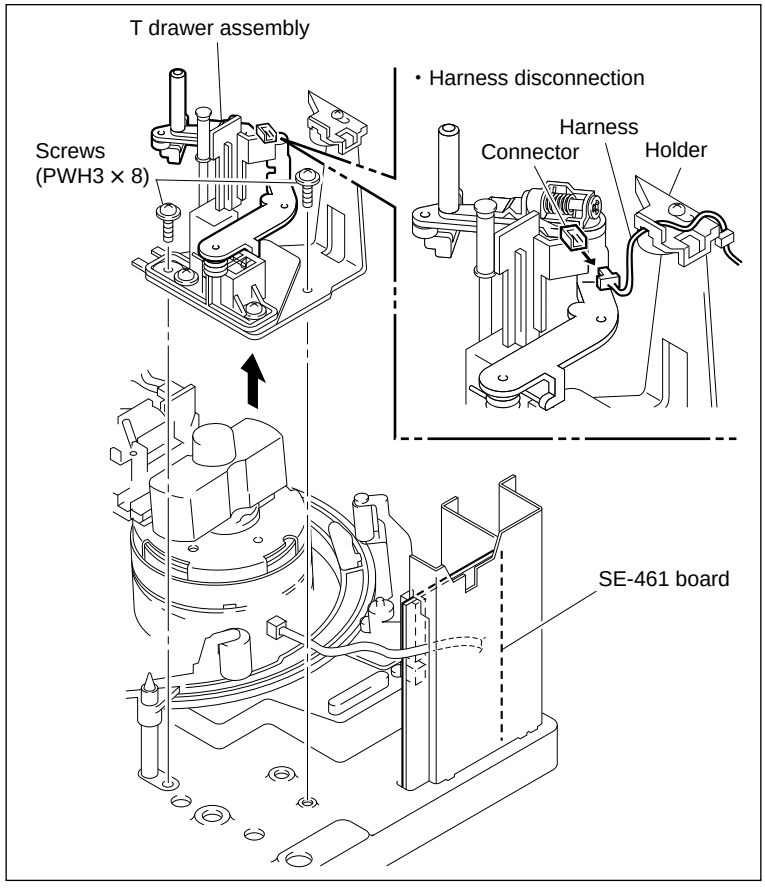
(2) Remove the three screws, then remove the S tension regulator assembly.



Remove the S Tension Regulator Assembly

8. Remove the T Drawer Assembly

(1) Disconnect the harness from the connector of the tape top sensor.
(2) Remove the harness form the holder of the adjustment plate.
(3) Remove the two screws, then remove the T drawer assembly.



Remove the T Drawer Assembly

9. Remove the Gear Box Assembly

Refer to steps 1 through 5 in Section 5-21.

10. Remove the Ring Rollers

(1) Remove the screws, then remove the ring rollers (A) and (B).

Note

Be careful not to touch the drum (especially, video heads).

(2) Move the threading ring in the direction indicated by the arrow.

(3) Remove the screw, then remove the ring roller (C).

Note

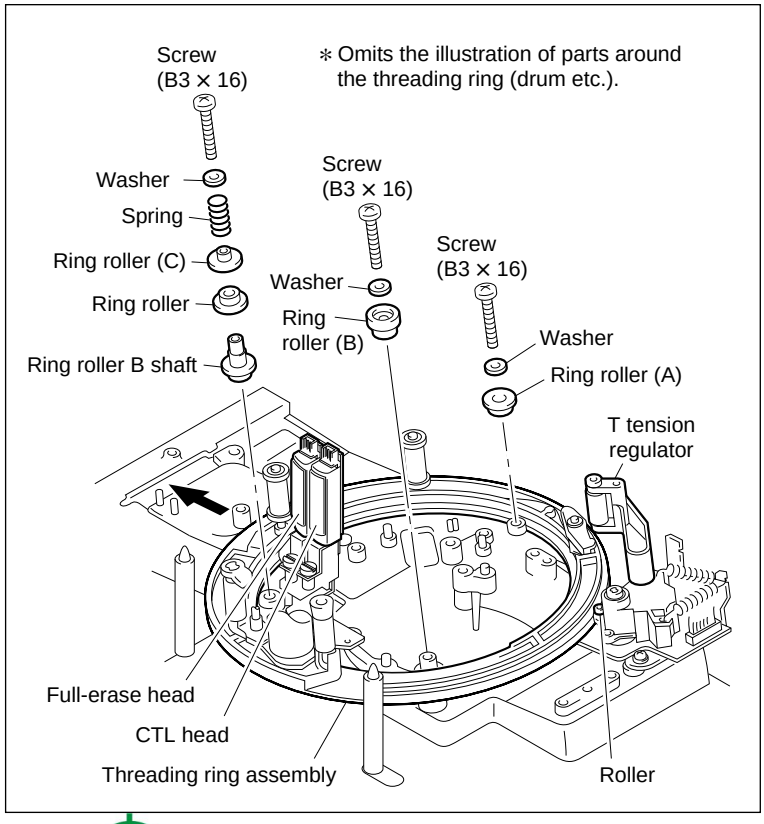
Be careful not to damage the CTL head or full-erase head.

11. Remove the Threading Ring Assembly

Remove the threading ring assembly from the chassis.

Note

Be careful not to damage the drum (especially, video heads or upper drum's tape running surface) and capstan motor shaft at that time.



Remove the Ring Rollers and Threading Ring Assembly

Installation

12. Attach the Ring Rollers (A) and (C)

(1) Assemble the ring rollers (A) and (C) in the order shown in the figure of step 10 and attach them in the chassis.

Note

Be careful not to damage the CTL head or full-erase head.

13. Cleaning

Clean the inside of a new threading ring assembly using a cleaning cloth moistened with cleaning fluid.

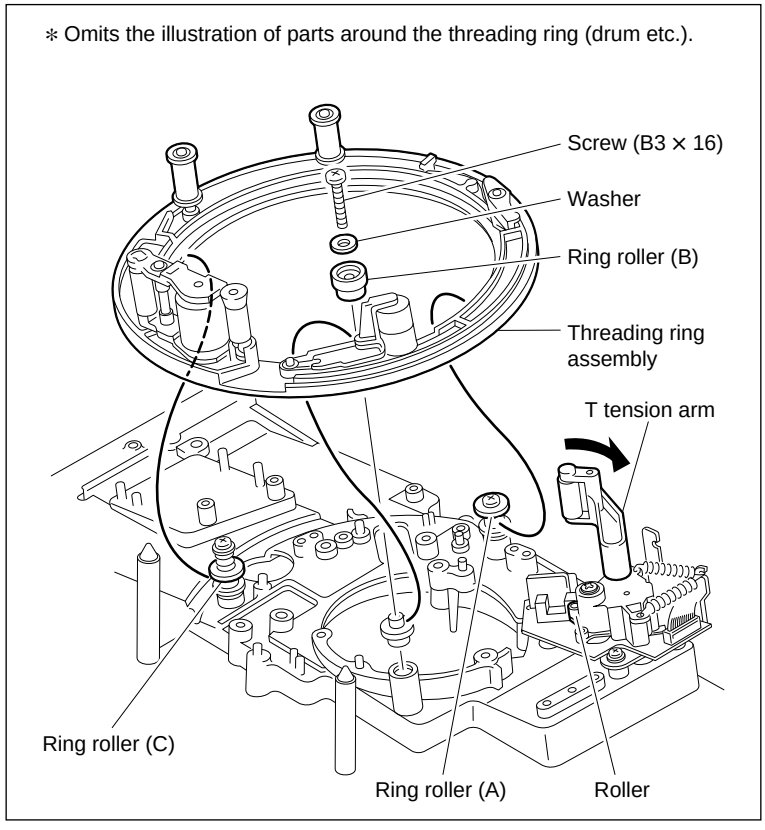
14. Attach the Threading Ring Assembly

Push the T tension arm in the direction indicated by the arrow and install the threading ring assembly while putting it in the grooves of the ring rollers (A) and (C).

15. Attach the Ring Roller (B)

(1) Pass the ring roller (B) through the roller shaft and tighten the screw while holding the threading ring assembly so that it is not dislocated from the grooves of the ring rollers (A) and (C).

(2) Confirm that the threading ring assembly is put between the three ring rollers. Moreover, confirm that the T tension regulator roller is not dislocated from the side of the threading ring.



Attach the Threading Ring Assembly and Ring Roller (B)

16. Attach the Gear Box Assembly

Refer to steps 10 through 15 in Section 5-21.

17. Comfirm the Threading Ring Operation

Turn the M gear of the gear box assembly for threading and unthreading directions, and confirm that the threading ring and three ring rollers smoothly rotate.

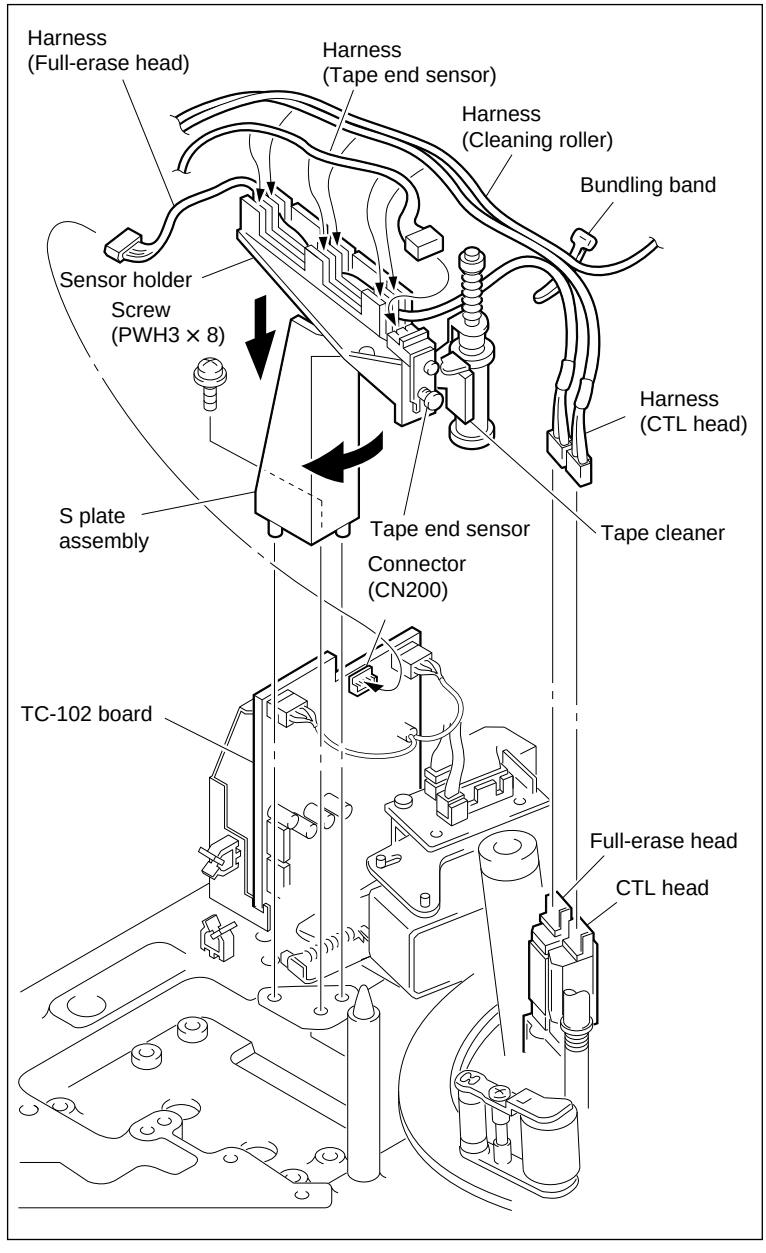
18. Attach the S Plate Assembly

(1) Insert the pins of the S plate assembly into the holes of the chassis and tighten the screw while moving the S plate assembly clockwise.

CAUTION

The tape cleaner has a sharp edge. Pay careful attention when handling the tape cleaner.

(2) Connect the harness to the connector CN200 on the TC-102 board.
(3) Fix the harness with a new bundling band (or the equivalent).
(4) Connect each harness to the connectors of the CTL head and full-erase head.
(5) Clamp each harness (CTL head, cleaning roller, and tape end sensor) to the grove of the sensor holder.
(6) Fix the harnesses with a new bundling band (or the equivalent).

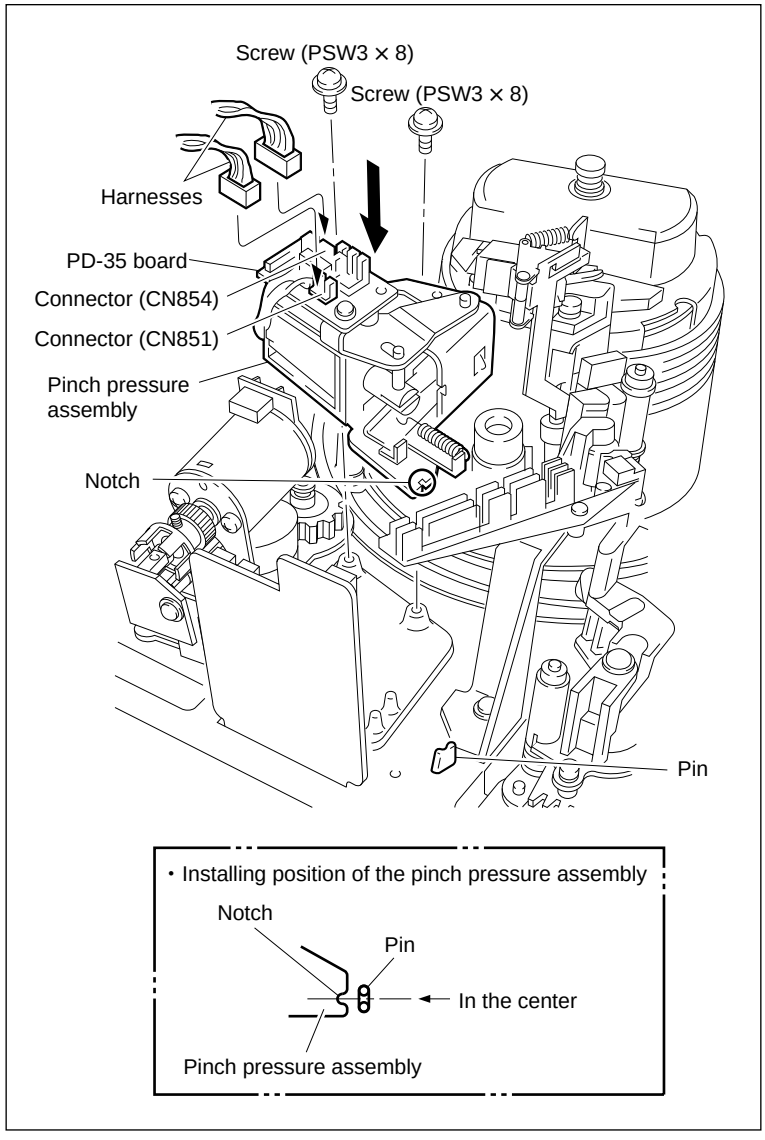


Attach the S Plate Assembly

19. Attach the Pinch Pressure Assembly

(1) Align the notch of the pinch pressure assembly with the center of the pin of the chassis, and tighten the two screws.

(2) Connect the harnesses to the connectors CN851 and CN854 on the PD-35 board.

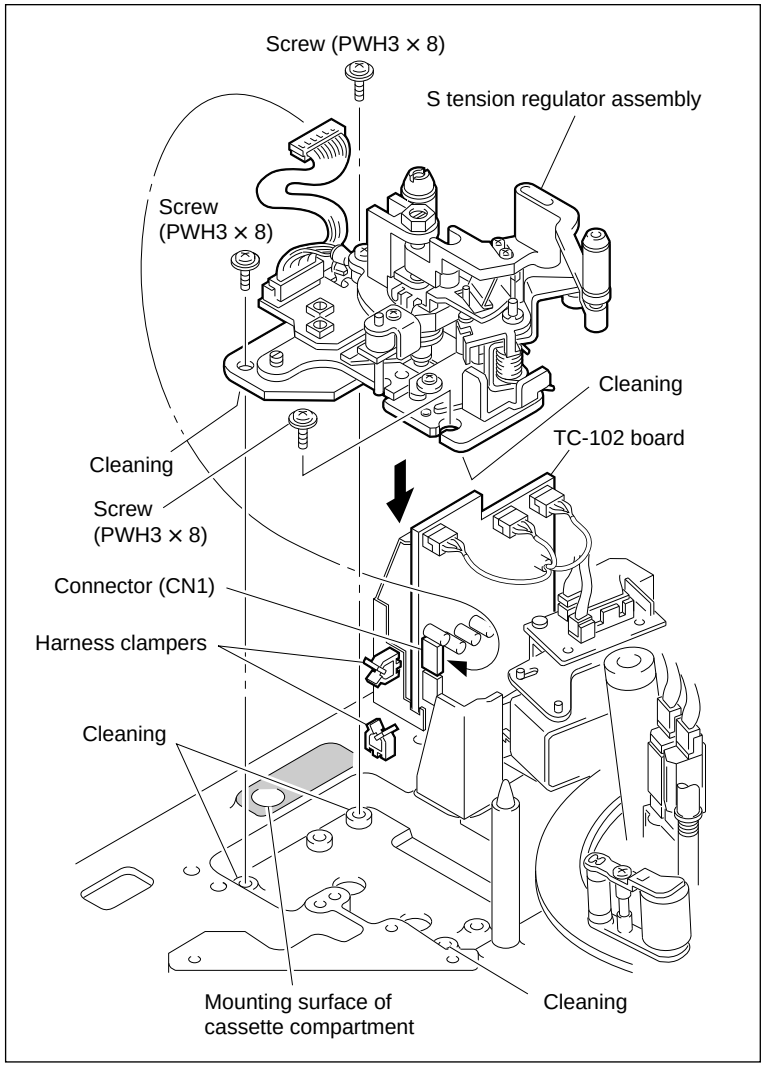


Attach the Pinch Pressure Assembly

20. Put the Unit into the Unthreading End State

21. Attach the S Tension Regulator Assembly

(1) Clean the mounting surfaces of the S tension regulator assembly and chassis in the three portions.
(2) Set the S tension regulator assembly and tighten with the three screws.
(3) Connect the harness to the connector CN1 on the TC-102 board.
(4) Put the harness in the harness clamper.
(5) Confirm that the harness does not protrude into the mounting surface (portion in the figure) of the cassette compartment.



Attach the S Tension Regulator Assembly

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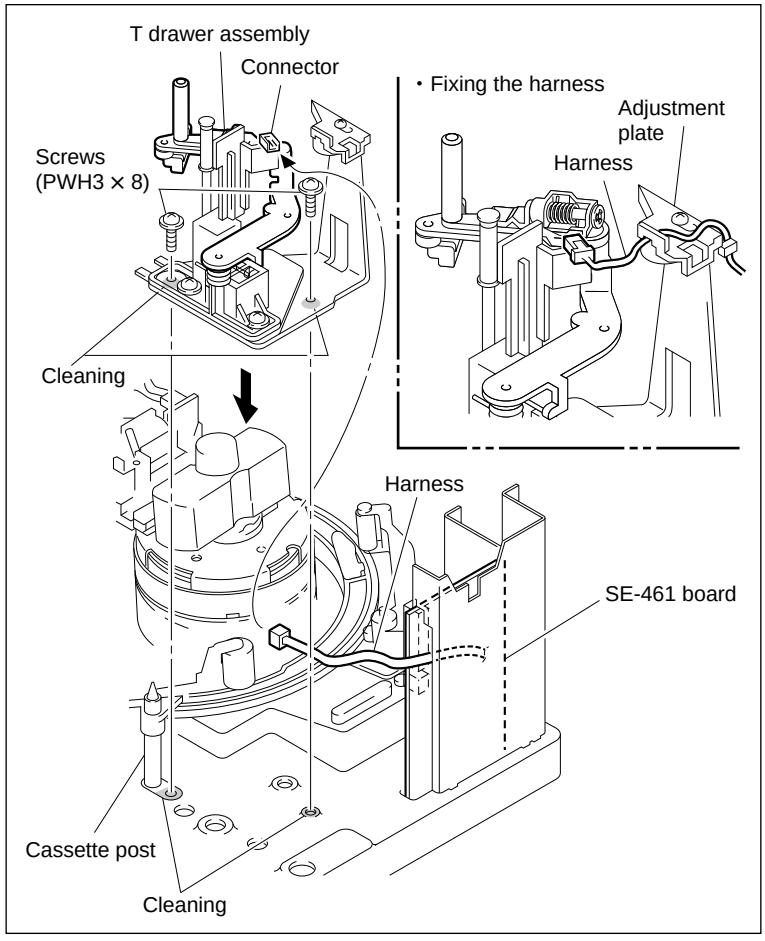
22. Attach the T Drawer Assembly

(1) Clean the mounting surface of the T drawer assembly and chassis.
(2) Set the T drawer assembly and tighten with the two screws.
(3) Connect the harness to the connector of the tape top sensor.
(4) Fix the harness to the holder of the adjustment plate.



Attach the T Drawer Assembly

23. Confirm the T Drawer Assembly Operation

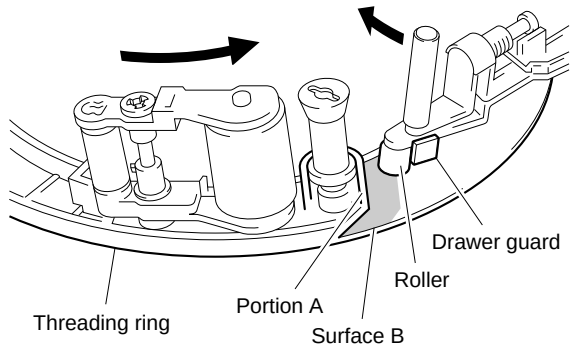
(1) Confirm that portion A of the threading ring is securely pushing the roller and drawer guide of the T drawer assembly during threading. Moreover, confirm that the lower surface of the roller does not touch with the surface B (portion in the figure) of the threading ring at that time. (Specification 1)

If specification 1 is not satisfied, adjust the height and vertical play of the T drawer arm. (Refer to step 9 in Section 5-25-1.)

(2) Confirm that the roller of the T drawer assembly smoothly moves along the inside of the threading ring during unthreading. Moreover, confirm that the lower surface of the roller does not touch with the surface B (portion in the figure) of the threading ring at that time. (Specification 2)

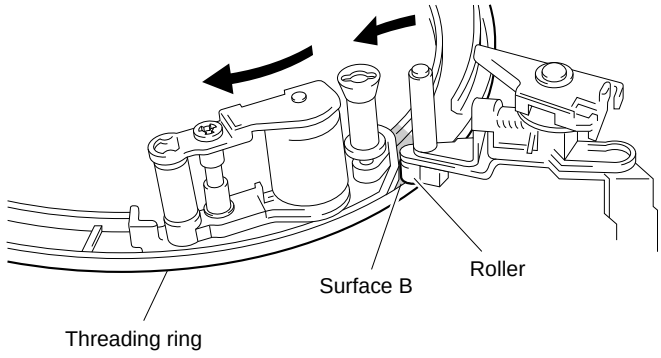
If specification 2 is not satisfied, adjust the height and vertical play of the T drawer arm. (Refer to step 9 in Section 5-25-1.)

・Threading



Spec. 1 : At the threading state, the lower surface of the roller does not touch with the surface B of the threading ring.

・Unthreading

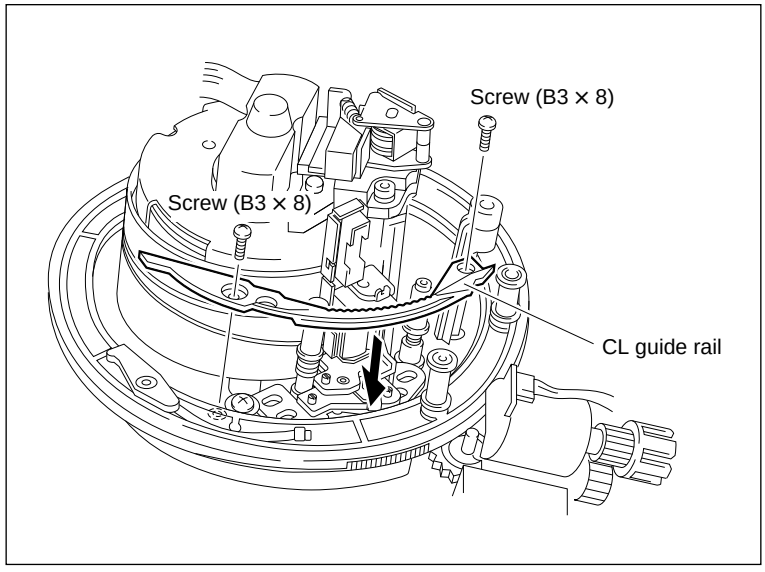


Spec. 2 : At the unthreading state, the lower surface of the roller does not touch with the surface B of the threading ring.

Confirm the T Drawer Assembly Operation

24. Attach the CL Guide Rail

Attach the CL guide rail with the two screws.

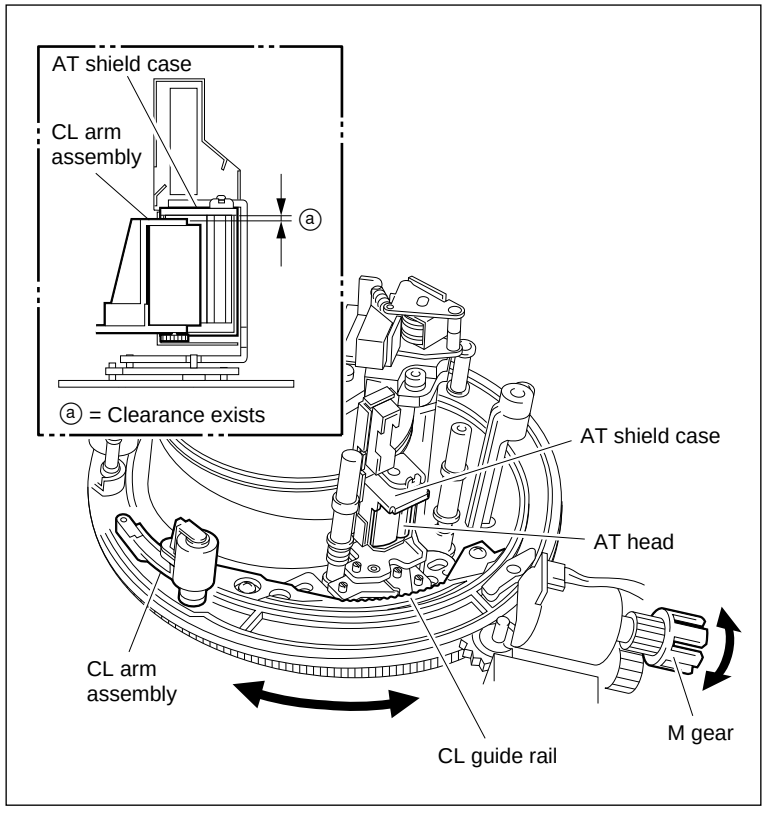


Attach the CL Guide Rail

25. Confirm the CL Arm Assembly Operation

Turn the M gear of the gear box assembly and confirm the following items while repeating the threading and unthreading.

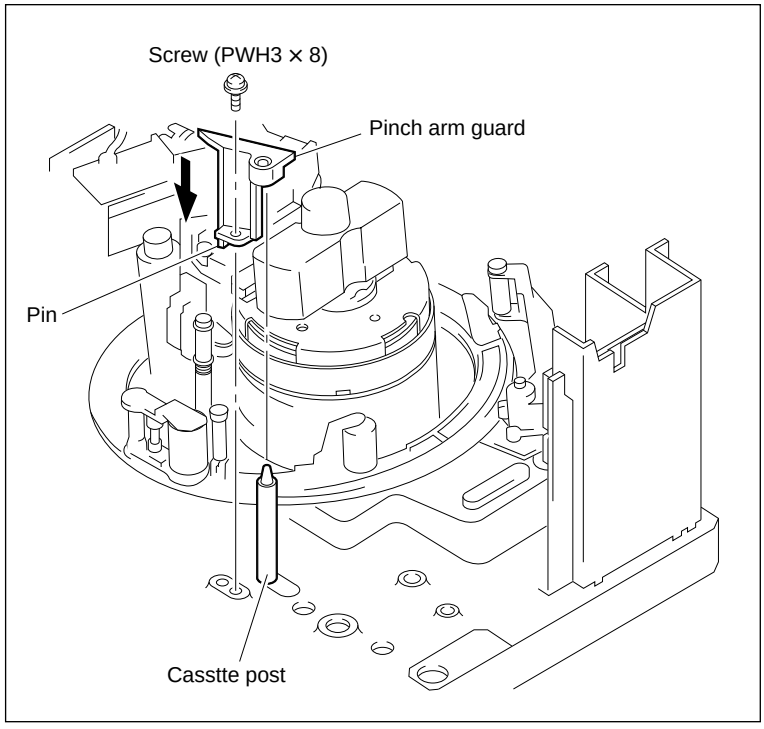
- The CL arm assembly moves along the CL guide rail.
- The cleaning roller cleans the AT head.
- A clearance exists between the top of the CL arm assembly and the AT shield case when the cleaning roller cleans the AT head.



Confiirm the CL Arm Assembly Operation

26. Attach the Pinch Arm Guard

(1) Pass the pinch arm guard through the cassette post and put the pin into the chassis hole.
(2) Fix the pinch arm guard with the screw.



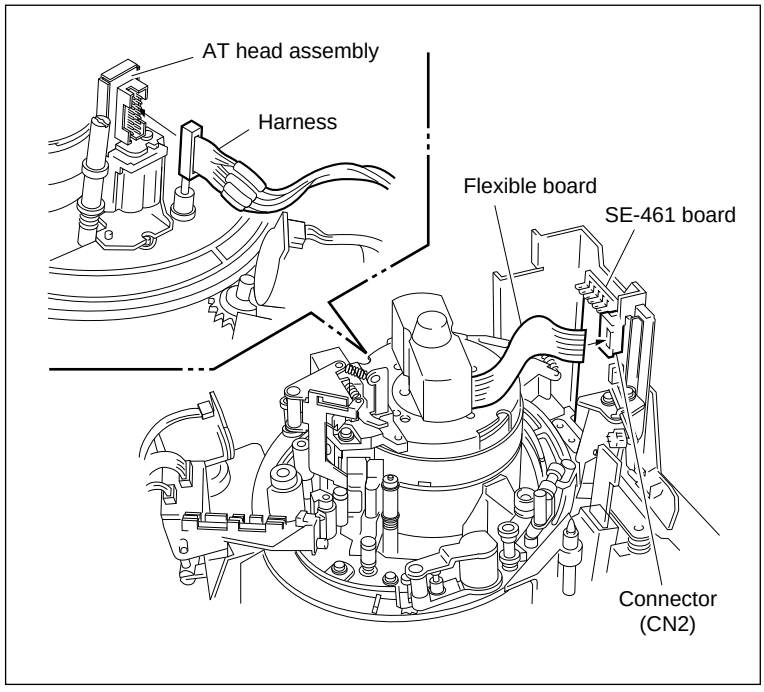
Attach the Pinch Arm Guard

27. Connect the Flexible Board

Connect the flexible board to connector CN2 on the SE-341 board, then lock.

28. Connect the Harness

Connect the harness to the connector of the AT head assembly.



Connect the Flexible Board/Harness

Adjustment after Replacement

29. Rerform the Pinch Pressure Clearance Adjustment

Refer to Section 5-11-2.

30. Confirm the Tape Running

Refer to Section 6-1-2.

5-23. S Tention Regulator Assembry Replacement

Outline

Replacement

1. Put the Unit into the Unthreading End State
2. Remove the S Tension Regulator Assembly
3. Attach the S Tension Regulator Assembly

Adjustment after Replacement

4. Perform the Tape Running Adjustment (Refer to Section 6-1-2.)
5. Perform the Tension Offset Adjustment (Refer to Section 3-2-5.)
   (A008: S/T TENSION OFFSET)
6. Perform the Adjusted Data Save (Refer to Section 3-2-5.)
   (A012: NV-RAM CONTROL)

Note

The replacement of the component part on the S tension regulator assembly requires a precise adjustment. Therefore, replace the whole assembly (A-8267-795-E).

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment assembly. (Refer to Section 1-5.)

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Removal

1. Put the Unit into the Unthreading End State

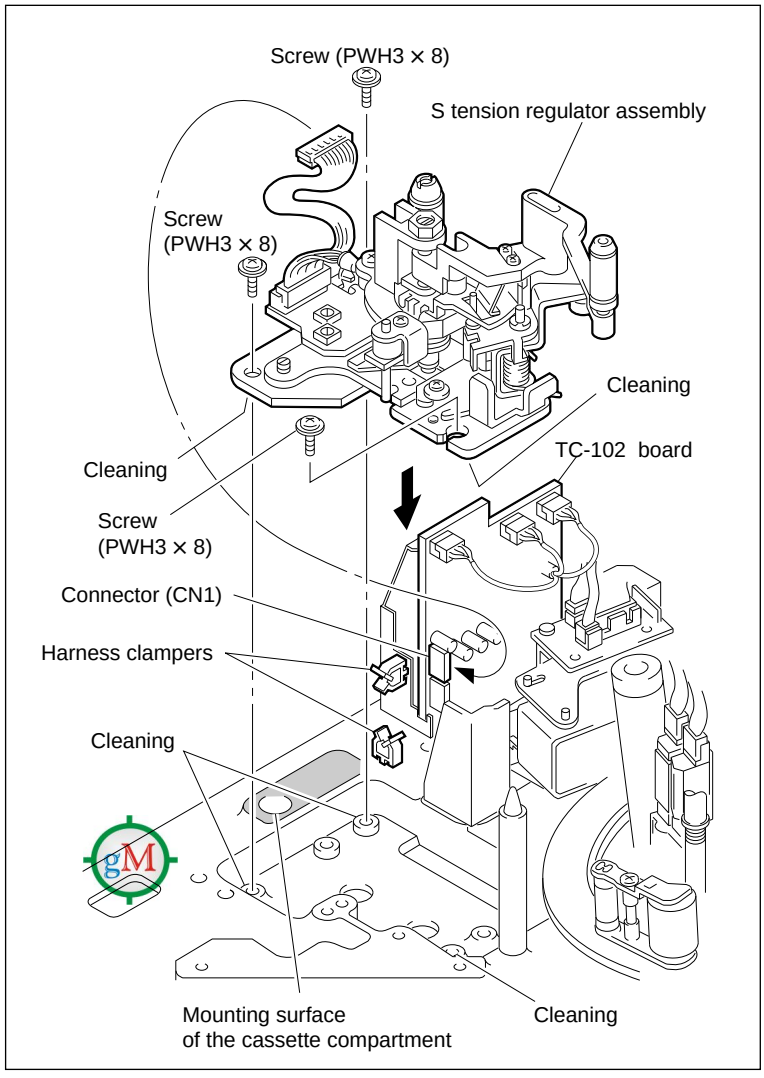
2. Remove the S Tension Regulator Assembly

(1) Disconnect the harness from the connector CN1 on the TC-102 board.
(2) Remove the three screws, then remove the S tension regulator assembly.

Installation

3. Attach the S Tension Regulator Assembly

(1) Clean the mounting surface of the S tension regulator assembly and chassis in three portions.
(2) Set the S tension regulator assembly and tighten the three screws.
(3) Connect the harness to connector CN1 on the TC-102 board.
(4) Put the harness in the harness clamper.
(5) Confirm that the harness does not protrude into the mounting surface (portion in the figure) of the cassette compartment.



Remove/Attach the S Tension Regulator Assembly

Adjustment after Replacement

4. Perform the Tape Running Adjustment

Refer to Section 6-1-2.

5. Perform the Tension Offset Adjustment

Refer to Section 3-2-5.
(A008: S/T TENSION OFFSET)

6. Perform the Adjusted Data Save

Refer to Section 3-2-5.
(A012: NV-RAM CONTROL)

5-24. T Tention Arm Replacement

Outline

Replacement

1. Remove the Tension Spring (on the T Tension Base Side)
2. Remove the T Tension Arm
3. Remove the Yoke Plate
4. Attach the Yoke Plate
5. Attach the T Tension Arm
6. Attach the Tension Spring (on the T Tension Base Side)
7. Confirm the T Tension Regulator Operation

Adjustment after Replacement

8. Perform the Tension Offset Adjustment (Refer to Section 3-2-5.)
   (A008: S/T TENSION OFFSET)
9. Perform the Adjusted Data Save (Refer to Section 3-2-5.)
   (A012: NV-RAM CONTROL)

Notes

- This section explains the replacement procedures of the T tension arm.
  When replacing whole of the T tension assembly, refer to exploded views of the maintenance manual volume 2.
  The T tension assembly supplied as repair parts differs in the harness length from one used in this unit because of standardization of repair parts. When replacing the T tension assembly, replace the harness by one used in this unit.
- Use a new stop washer when the T tension arm is replaced.
  Stop washer (2.3): 3-669-596-00

Preparation

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper lid. (Refer to Section 1-3-1.)
4. Remove the plate MD assembly. (Refer to Section 1-4.)
5. Remove the cassette compartment assembly. (Refer to Section 1-5.)

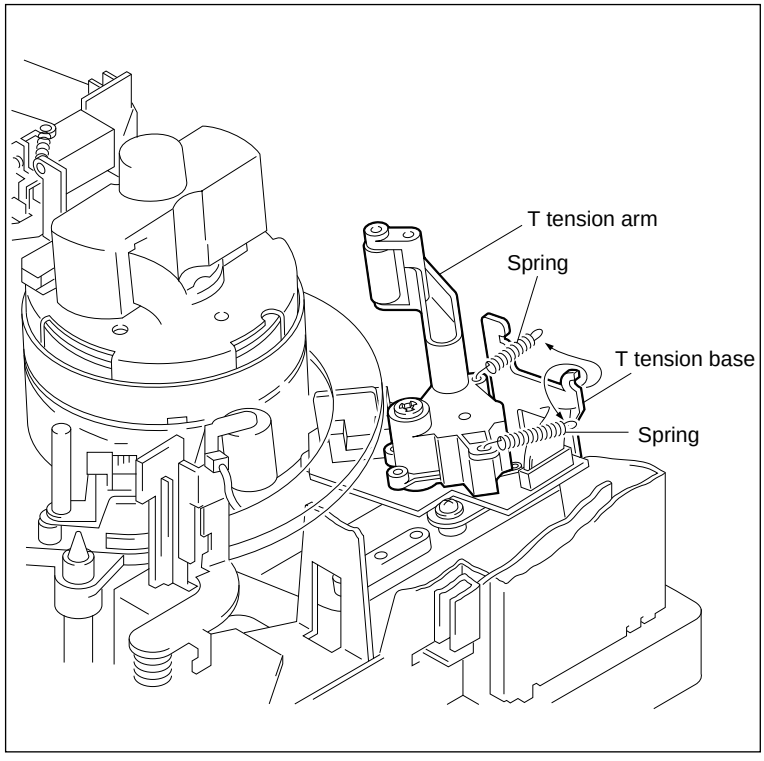
Tools

- Locking compound: 7-432-114-11
- Cleaning fluid: 9-919-573-01
- Cleaning cloth: 3-184-527-01

Removal

1. Remove the Tension Spring

Remove the two springs caught on the T tension base.



Remove the Tension Spring

2. Remove the T Tension Arm

(1) Remove the stop washer, then remove the T tension arm.

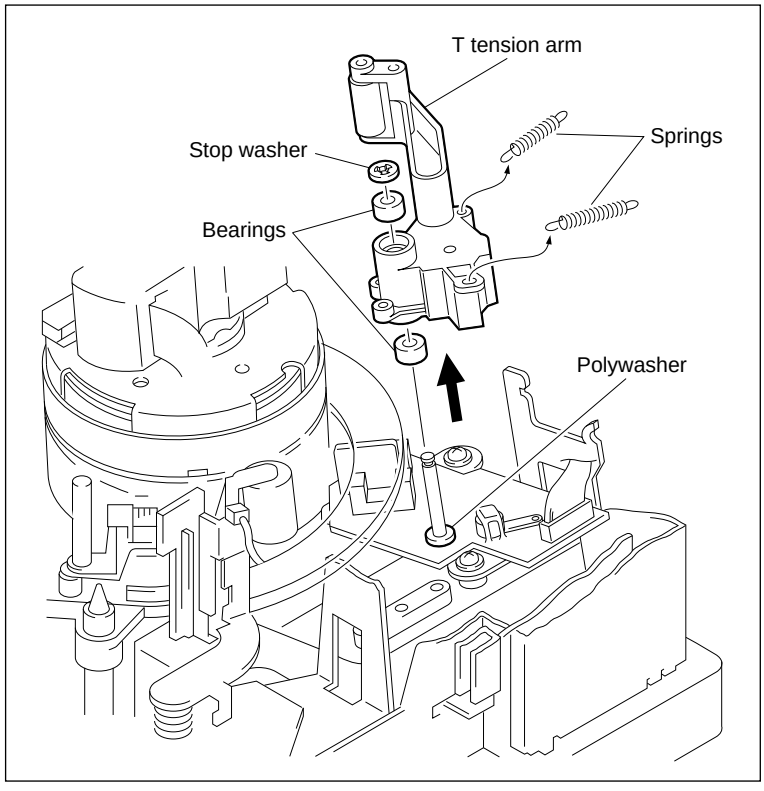
Notes

- Do not reuse the stop washer.
- A polywasher may be attached together when the T tension arm is removed. In this case, remove the polywasher from the T tension arm and return it to the shaft.

(2) Remove the two bearings and two springs from the T tension arm.

Note

The two springs are the same.



Remove the T Tension Arm

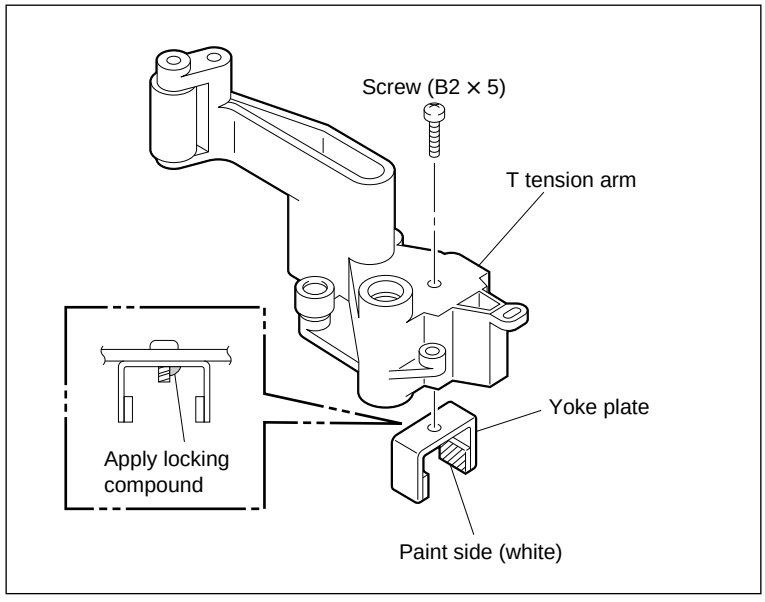
3. Remove the Yoke Plate

Remove the screw, then remove the yoke plate from the T tension arm.

Installation

4. Attach the Yoke Plate

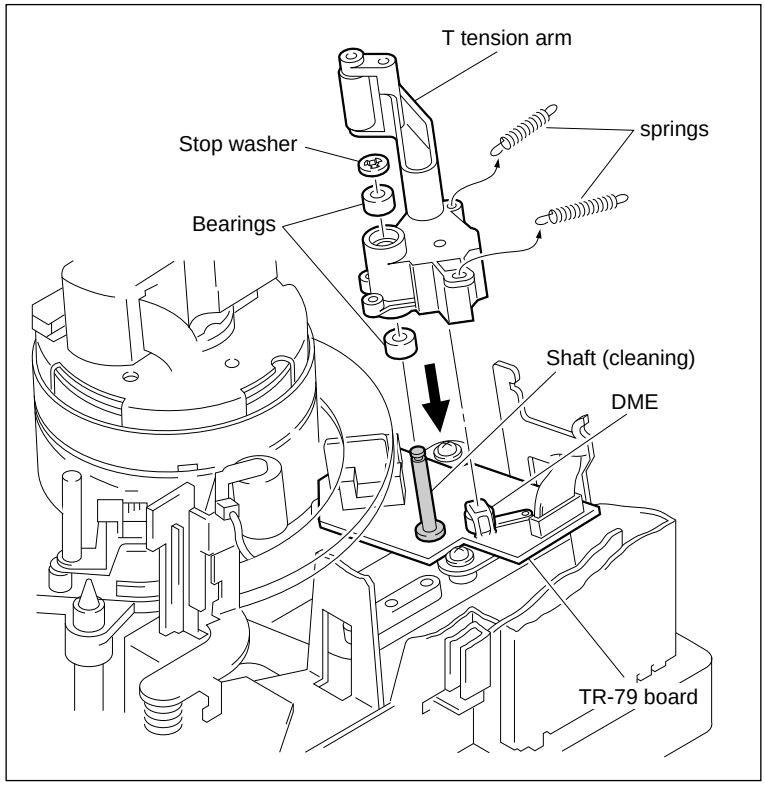
(1) Put the yoke plate in the direction shown in the figure and tighten the screw.
(2) Slightly apply the locking compound to the yoke plate.



Remove/Attach the Yoke Plate

5. Attach the T Tension Arm

(1) Clean the shaft.
(2) Insert the two bearings into the T tension arm.
(3) Put the two springs on the T tension arm as shown in the figure.
(4) Pass the T tension arm through the shaft while putting DME on the TR-79 board in the T tension arm.
(5) Fix the T tension arm with a new stop washer.



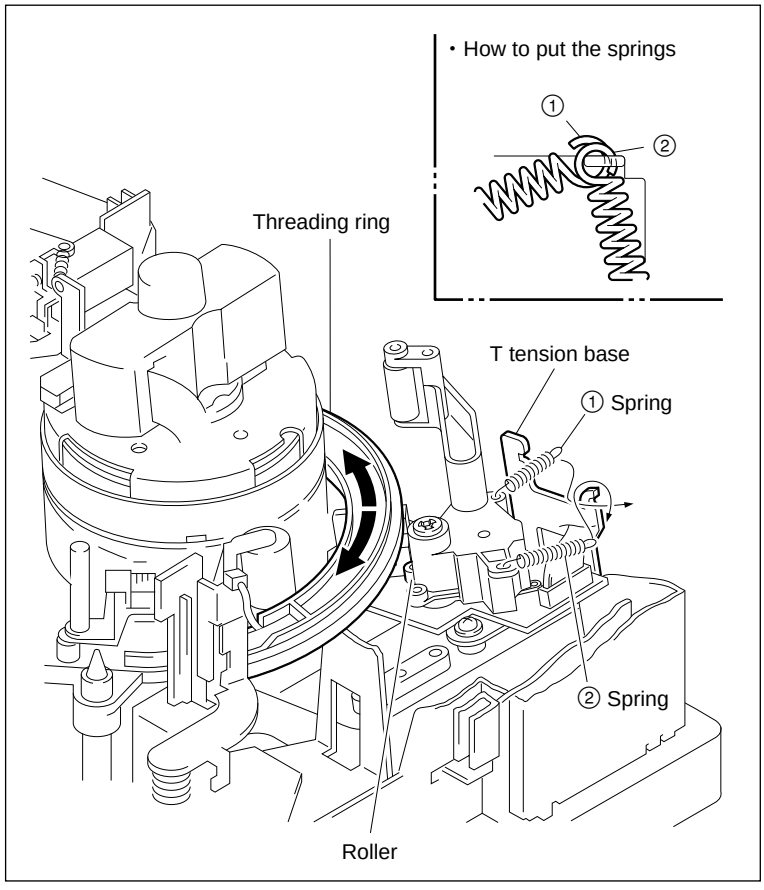
Attach the T Tension Arm

6. Attach the Tension Spring

Put the two springs removed in (2) of step 2 on the T tension base in the order of ① and ② in the direction shown in the figure.

7. Confirm the T Tension Regulator Operation

Put the threading ring into the threading/unthreading state and confirm that the T tension regulator roller is not dislocated from the threading ring and operates normally.



Attach the Tension Spring

Adjustment after Replacement

8. Perform the Tension Offset Adjustment

(Refer to Section 3-2-5.)
(A008: S/T TENSION OFFSET)

9. Perform the Adjusted Data Save

(Refer to Section 3-2-5.)
(A012: NV-RAM CONTROL)

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5-25. T Drawer Arm Replacement

5-25-1. T Drawer Arm Replacement

Outline

Replacement

1. Remove the T Drawer Assembly
2. Remove the T Drawer Arm
3. Remove the Slant Guide
4. Remove the Slant Guide Base
5. Remove the Drawer Guide
6. Attach the Drawer Guide
7. Attach the Slant Guide Base
8. Attach the Slant Guide
9. Attach the T Drawer Arm
10. Attach the T Drawer Assembly
11. Confirm the T Drawer Assembly Operation

Adjustment after Replacement

12. Slant Guide Slantness Adjustment (Refer to Section 5-25-2.)

Notes

- The slant guide, slant guide base, and drawer guard can be replaced in the same procedure as described in this section.
- Use a new stop washer when the T drawer arm is replaced.
  Stop washer (2.3): 3-669-596-00

Preparation

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper lid. (Refer to Section 1-3-1.)
4. Remove the plate MD assembly. (Refer to Section 1-4.)
5. Remove the cassette compartment assembly. (Refer to Section 1-5.)

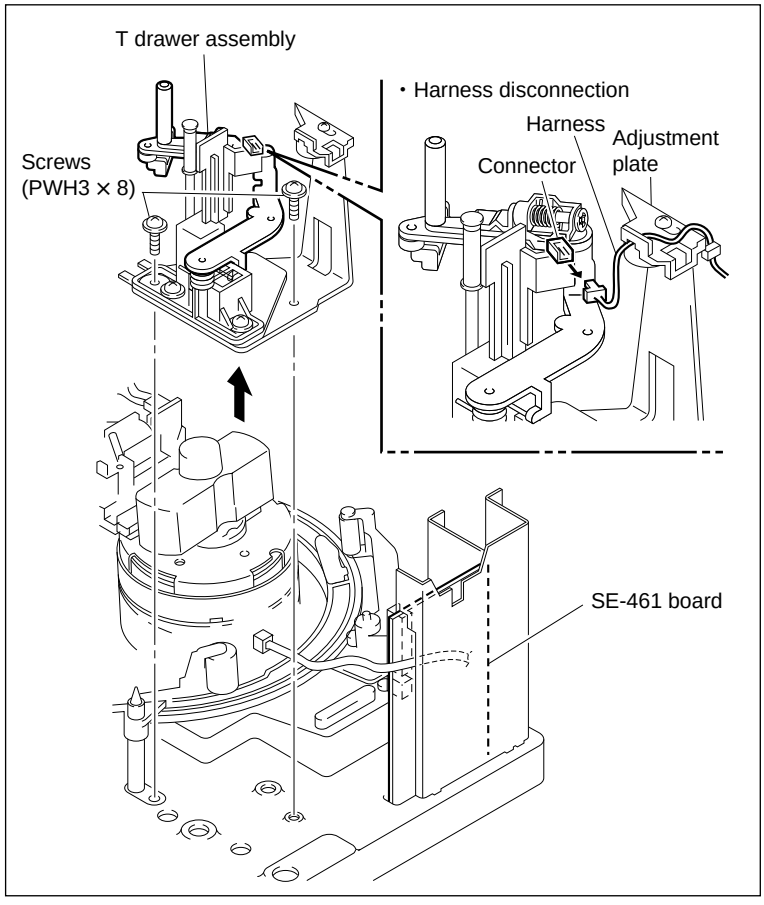
Tools

- Locking compound: 7-432-114-11
- Cleaning fluid: 9-919-573-01
- Cleaning cloth: 3-184-527-01
- Calipers (or the equivalent)

Removal

1. Remove the T Drawer Assembly

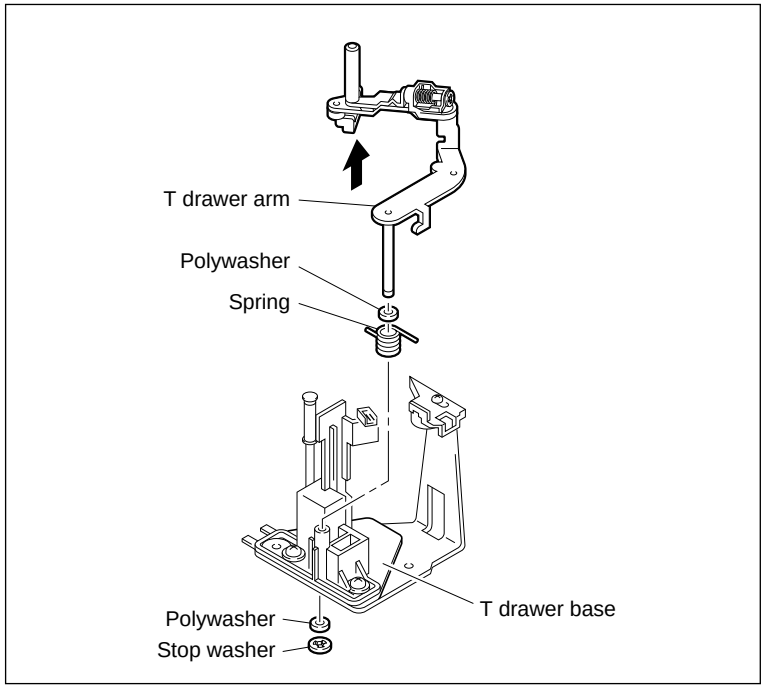
(1) Disconnect the harness from the connector of the tape top sensor.
(2) Remove the harness from the holder of the adjustment plate.
(3) Remove the two screws, then remove the T drawer assembly.



Remove the T Drawer Assembly

2. Remove the T Drawer Arm

(1) Remove the stop washer and polywasher, then remove the T drawer arm from the T drawer base.
(2) Remove the spring and polywasher.



Remove the T Drawer Arm

3. Remove the Slant Guide
Remove the stop washer, then remove the slant guide and spring from the T drawer arm.

4. Remove the Slant Guide Base
Remove the screw, then remove the slant guide base from the T drawer arm.

5. Remove the Drawer Guard
Remove the screw, then remove the drawer guard from the T drawer arm.

Installation

6. Attach the Drawer Guard
(1) While pushing the drawer guard in the direction indicated by the arrow, tighten the screw.
(2) Apply the locking compound to the screw.

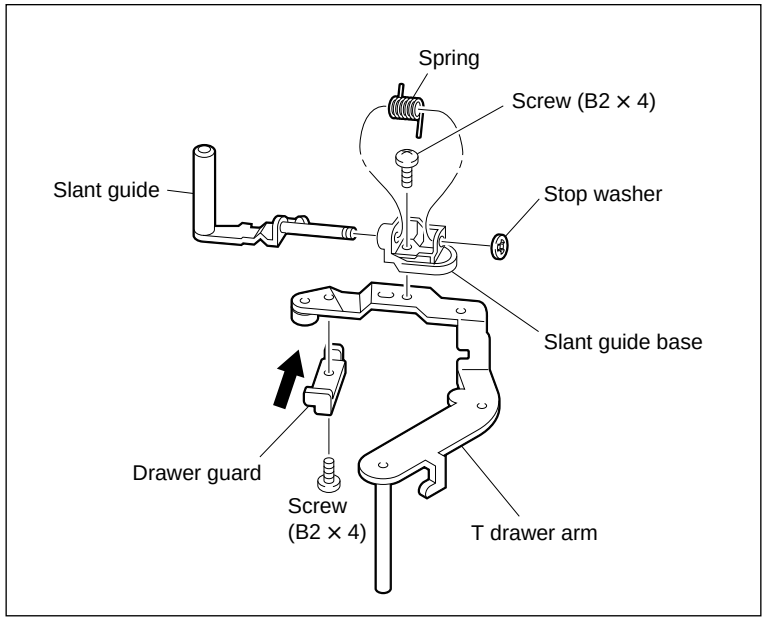
7. Attach the Slant Guide Base
(1) Move the slant guide base counterclockwise and tighten the screw.
(2) Apply the locking compound to the screw.

8. Attach the Slant Guide
(1) Pass the spring through the Slant guide base while passing it through the slant guide shaft.
(2) Put the spring on the slant guide base.
(3) Fix the slant guide with a new stop washer.

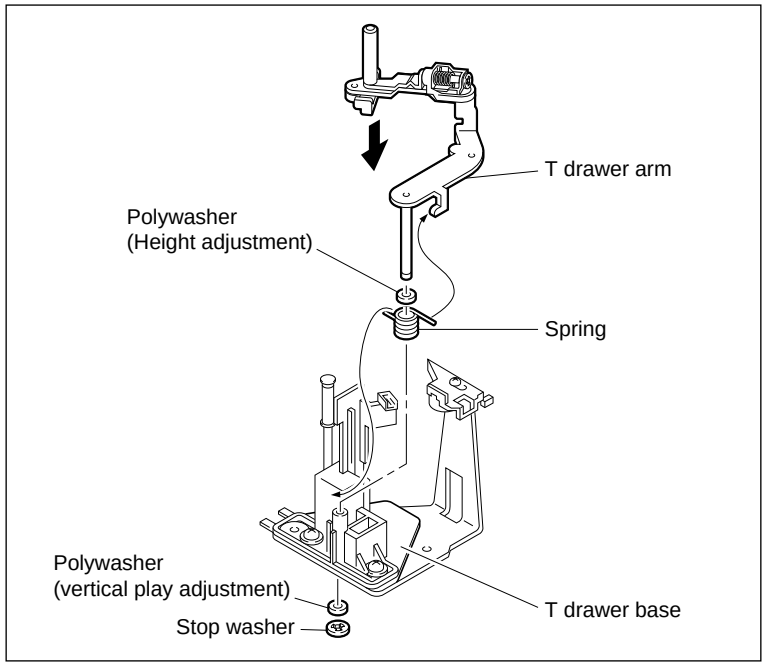
9. Attach the T Drawer Arm
(1) Pass the polywasher and spring through the T drawer base while passing them through the shaft of the T drawer arm assembly.
(2) Put the spring on the T drawer arm and T drawer base.
(3) Confirm that specification 1 is satisfied with the T drawer arm pushed downward.

If specification 1 is not satisfied, perform the following adjustment. (Height adjustment)
① Remove the T drawer arm and spring.
② Adjust the polywasher value at the top of the T drawer base.
③ Confirm that specification 1 is satisfied.

(4) Pass the polywasher through the shaft and fix the T drawer arm with a new stop washer.



T Drawer Arm Disassemble/Assemble



Attach the T Drawer Arm

(5) Move the T drawer arm manually in the vertical direction. At that time, confirm that the vertical play satisfies specification 2.

If specification 2 is not satisfied, perform the following adjustment. (Vertical play adjustment)

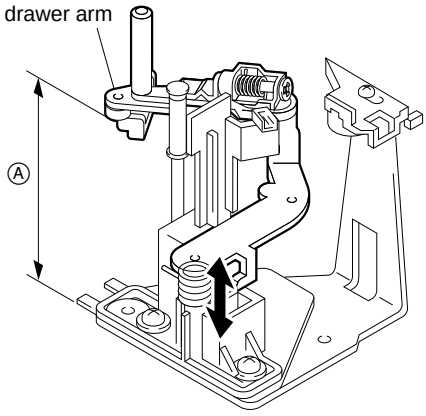
① Remove the stop washer.
② Adjust the polywasher value at the bottom of the T drawer base.
③ Fix the T drawer arm using a new stop washer and confirm that specification 2 is satisfied.

(6) Confirm that the height of the T drawer arm satisfies the specification 3 with the T drawer arm turned to clockwise by finger.
If specification 3 is not satisfied, perform the steps (3) and later again.

Note

Some of the T drawer assemblies have no arm stopper. In these cases, the confirmation described above, step 6, is not required.

・T drawer arm height adjustment/vertical play adjustment



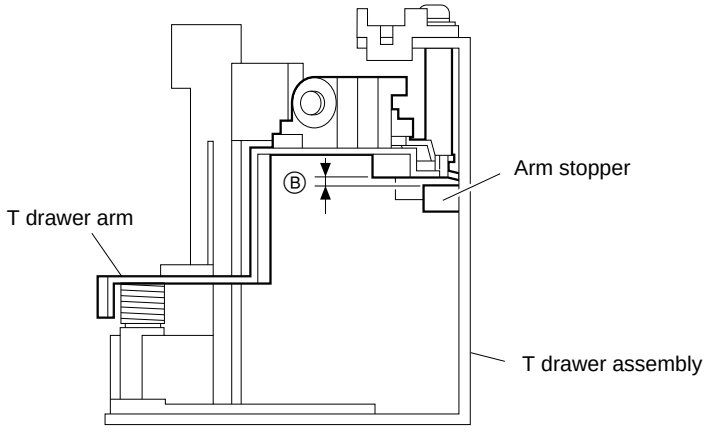
Spec. 1 : (height)
Ⓐ = 36.3 mm to 36.7 mm
Spec. 2 : (vertical play)
0.2 mm or less

・Spec. 1 and 2 are not satisfied.

・Polywasher to adjustment

diameter	thickness	Part No.
3.0 mm	0.13 mm	3-701-439-01
	0.25 mm	3-701-439-11
	0.5 mm	3-701-439-21

< Side view >

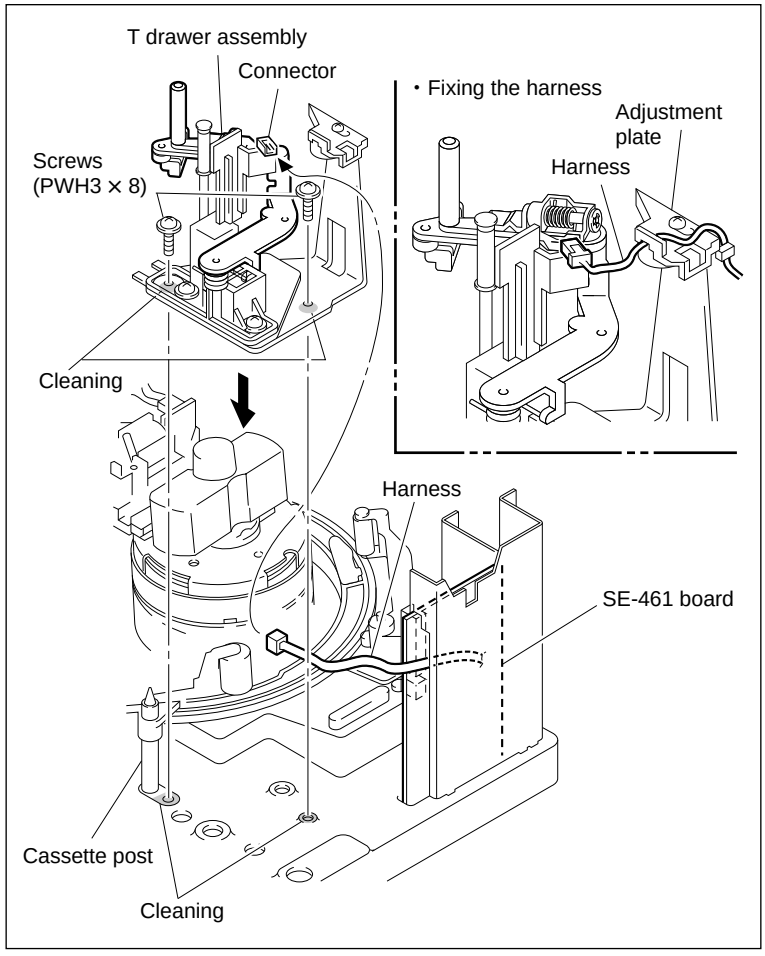


Spec. 3 : Ⓑ ≧ 0.2 mm
(Between arm stopper and arm)

Attach the T Drawer Arm

10. Attach the T Drawer Assembly

(1) Clean the mounting surface of the T drawer assembly and chassis.
(2) Set the T drawer assembly and tighten the two screws.
(3) Connect the harness to the connector of the tape top sensor.
(4) Fix the harness to the holder of the adjustment plate.



Attach the T Drawer Assembly

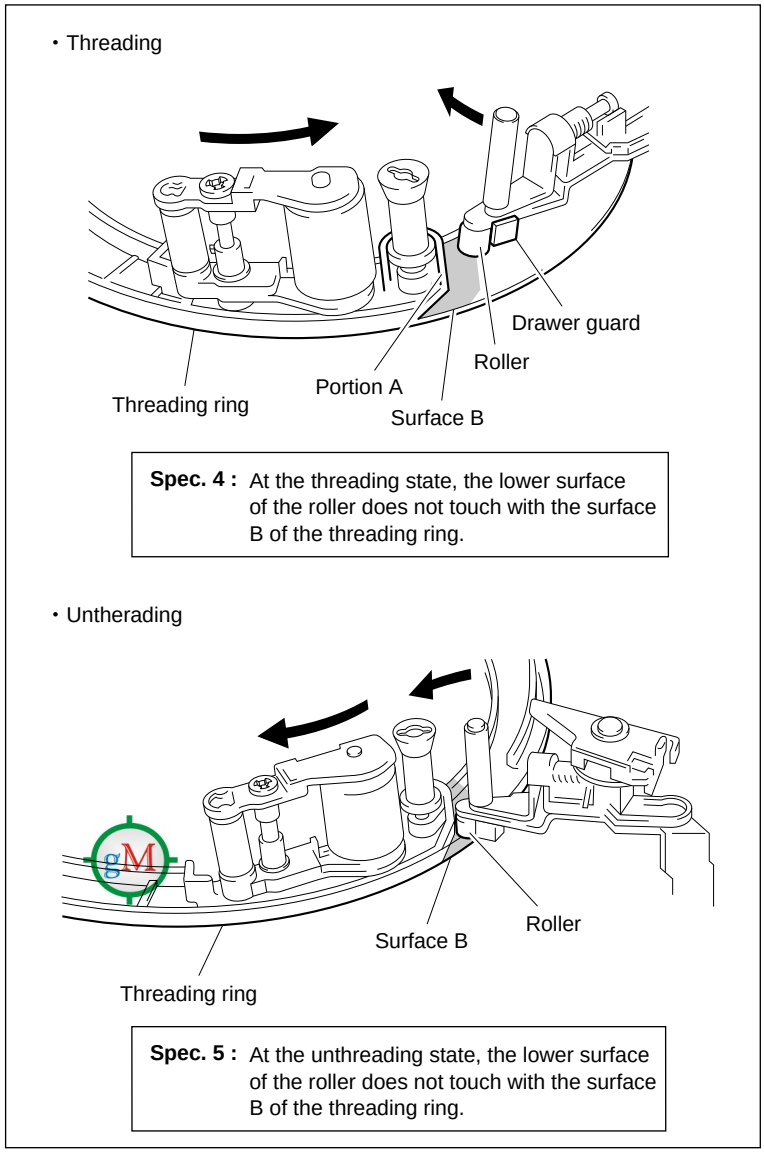
11. Confirm the T Drawer Assembly Operation

(1) Confirm that portion A of the threading ring is securely pushing the roller and drawer guard of the T drawer assembly during threading. Moreover, confirm that the lower surface of the roller does not touch with the surface B (portion in the figure) of the threading ring at that time. (Specification 4)

If specification 4 is not satisfied, adjust the height and vertical play of the T drawer arm. (Refer to step 9.)

(2) Confirm that the roller of the T drawer assembly smoothly moves along the inside of the threading ring during unthreading. Moreover, confirm that the lower surface of the roller does not touch with the surface B (portion in the figure) of the threading ring at that time. (Specification 5)

If specification 5 is not satisfied, adjust the height and vertical play of the T drawer arm. (Refer to step 9.)


• Threading
Drawer guard
Roller
Portion A
Threading ring
Surface B
Spec. 4 : At the threading state, the lower surface of the roller does not touch with the surface B of the threading ring.
• Untherading
Surface B
Roller
Threading ring
Spec. 5 : At the unthreading state, the lower surface of the roller does not touch with the surface B of the threading ring.

Confim the T Drawer Assembly Operation

Adjustment after Replacement

12. Slant Guide Slantness Adjustment

Refer to Section 5-25-2.

5-25-2. Slant Guide Slantness Adjustment

Note

Be sure to perform this adjustment when the T drawer arm and slant guide are replaced.

Tools

- Cassette reference plate (L)(MW-088): J-6320-880-A
- Tension regulator slantness check tool (BW-080): J-6190-800-A
- Thickness gauge: 9-911-053-00
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Locking compound: 7-432-114-11
- Cassette tape for Betacam SP (L cassette): BCT-90MAL

Confirmation

1. Set the Cassette Reference Plate (L)

Put the cassette reference plate (L) in the direction shown in the figure and align it with the two cassette posts.

2. Confirm the Slant Guide Slantness

(1) Press the check tool against the slant guide from the directions indicated by arrows A and B.
(2) Confirm that the clearance between the slant guide and tool satisfies specifications 1 and 2.

If specifications 1 and 2 are not satisfied, repeat steps (3) and (4) below until they are satisfied.

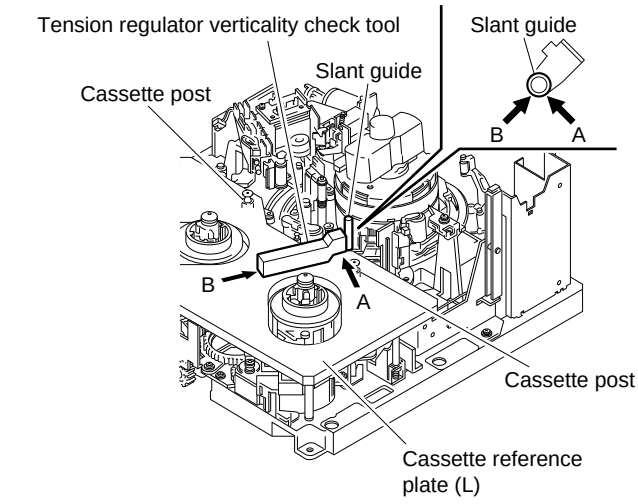
(3) Bend the slant guide so that specifications 1 and 2 are satisfied.
(4) Repeat the threading/unthreading and reconfirm that specifications 1 and 2 are satisfied.

3. Remove the Cassette Reference Plate

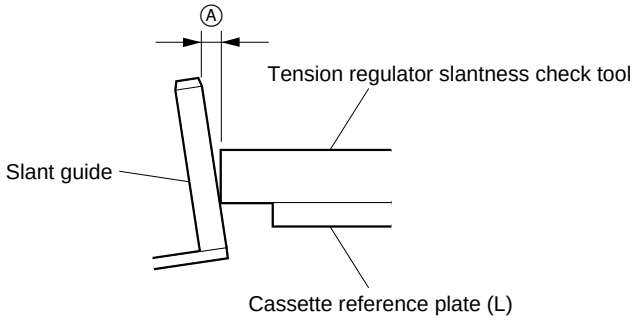
Remove the tension regulator slantness check tool and cassette reference plate (L).

4. Cleaning

Clean the slant guide using a cleaning cloth moistened with cleaning fluid.

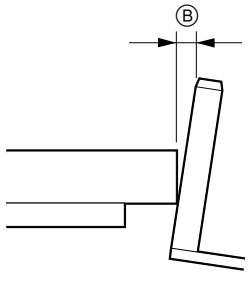


< Direction of A >



Spec. 1 : 0.15 mm ≦ Ⓐ ≦ 0.25 mm

< Direction of B >



Spec. 2 : 0.15 mm ≦ Ⓑ ≦ 0.25 mm

Confirm the Slant Guide Slantness

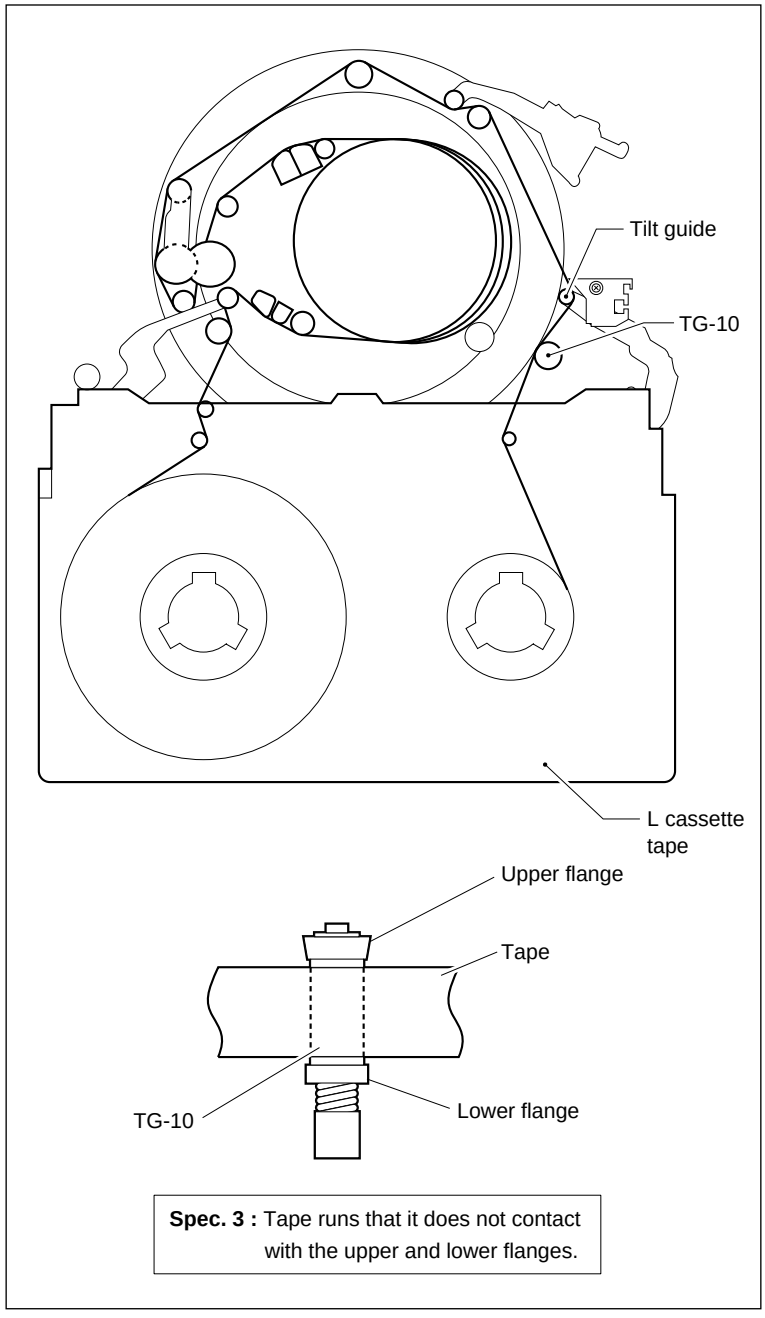
5. Set the L Cassette Tape

(1) Put the RS table block assembly into the L cassette position.
(2) Set the L cassette tape and put a weight so that the cassette is stable.
Weight about 1,000 g is suitable.

6. Confirm the Tape-running at TG-10 Guide

(1) Put the unit into the F.FWD mode, then put it into the PLAY mode after approximately three seconds.
(2) Confirm that the tape runs at the TG-10 guide with specification 3 is satisfied state.

If specification 3 is not satisfied, perform the adjustments in steps 7 and later.



Confirm the Tape-running at TG-10 Guide

Adjustment

7. Loosen the Screw

Loosen the fixing screw of the adjustment plate by 1/4 to 1/2 turn.

8. Adjust the Slant Guide Slantness

(1) Insert a 3 mm flatbladed screwdriver into the notch of the adjustment plate.
(2) Adjust the position of the adjustment plate so that specification 3 is satisfied.

- When the tape touches with the upper flange: Move the adjustment plate in the direction indicated by arrow A.
- When the tape touches with the lower flange: Move the adjustment plate in the direction indicated by arrow B.

9. Tighten the Screw

Tighten the screw loosened in step 7.

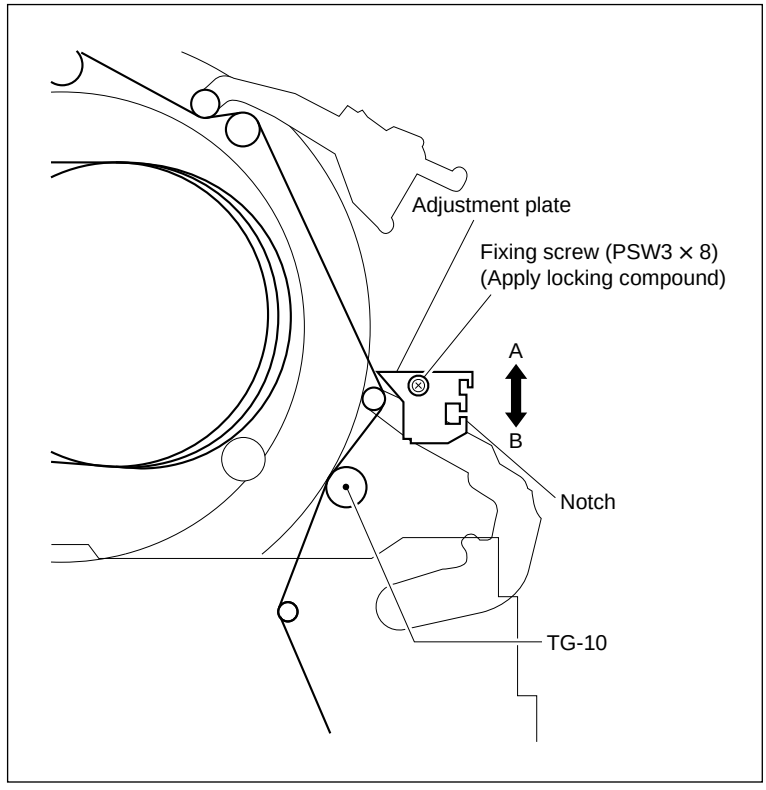
10. Reconfirm the Tape-running at TG-10 Guide

(1) Put the unit into the unthreading end mode.
(2) Put the unit into the PLAY mode again, and reconfirm that the tape runs at the TG-10 guide with specification 3 is satisfied state.

If specification 3 is not satisfied, repeat steps 7 through 10.

11. Apply the Locking Compound

Apply the locking compound to the fixing screw of the adjustment plate.



Adjust the Slant Guide Slantness

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5-26. Cassette Compartment Motor Replacement

Outline

Replacement

1. Disconnect the Harness (CN935/CL-29 Board)
2. Remove the Warm
3. Remove the Cassette Compartment Motor
4. Remove the Motor Joint
5. Remove the Spacer and Disconnect the Harness
6. Harness Soldering
7. Attach the Motor Joint
8. Attach the Spacer and Warm
9. Attach the Cassette Compartment Motor
10. Apply the Grease
11. Connect the Harness (CN935/CL-29 Board)

Adjustment after Replacement

12. Check the Cassette Compartment Motor Operation (Refer to Section 3-2-2.) (C013: CASSETTE COMP.)

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 1-3-1.)
3. Remove the plate MD assembly. (Refer to Section 1-4.)
4. Remove the cassette compartment assembly. (Refer to Section 1-5.)

Tools

- L wrench (Across flat has 0.89 mm): 7-700-736-06
- Grease (SGL-601): 7-651-000-10
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Calipers (or the equivalent)

Removal

1. Disconnect the Harness

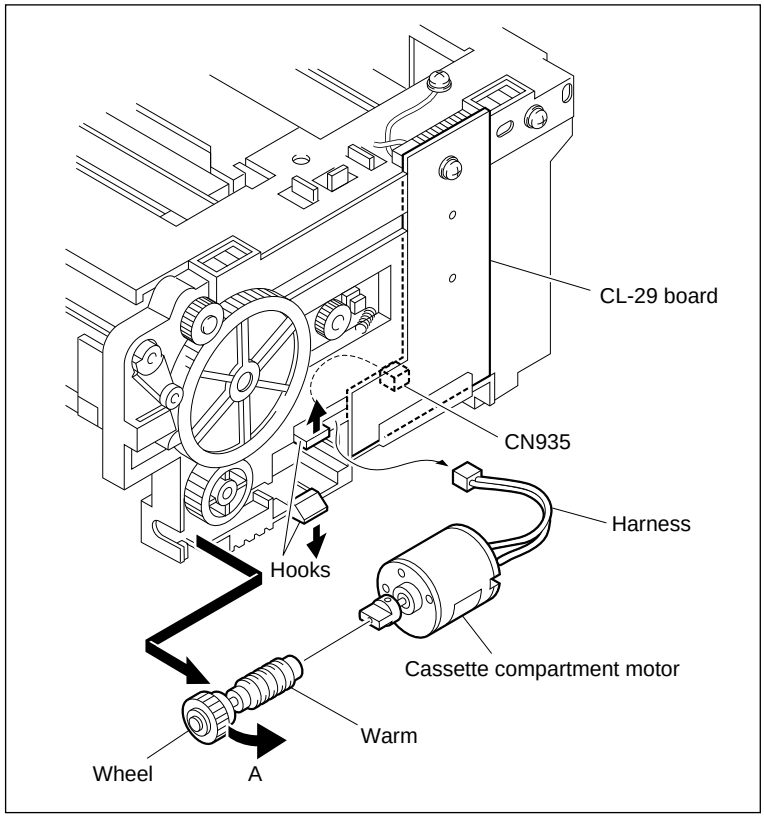
Disconnect the harness from the connector CN935 on the CL-29 board.

2. Remove the Warm

Push the wheel in the direction indicated by arrow A and take out the warm.

3. Remove the Cassette Compartment Motor

Spread the hooks of the chassis and push out the cassette compartment motor from the inside of the cassette compartment.



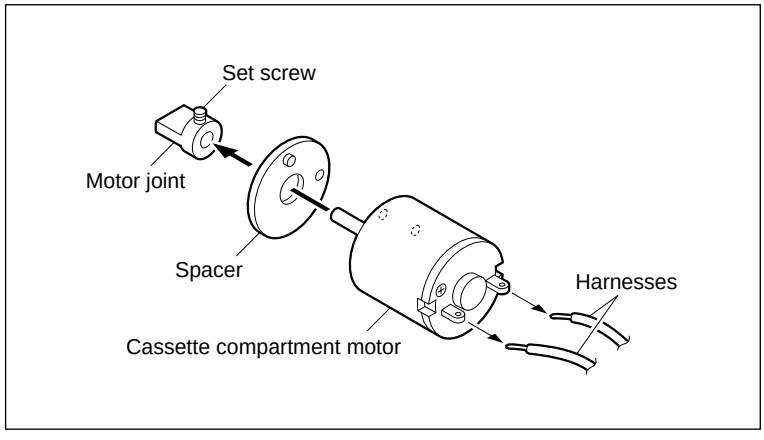
Remove the Cassette Compartment Motor (1)

4. Remove the Motor Joint

Loosen the set screw by two to three turns and remove the motor joint.

5. Remove the Spacer and Disconnect the Harness

(1) Remove the spacer.
(2) Unsolder and disconnect the harness from the motor.



Remove the Cassette Compartment Motor (2)

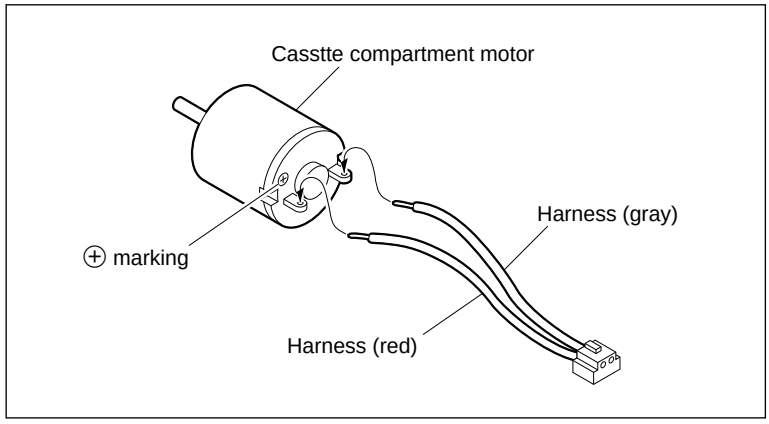
Installation

6. Harness Soldering

Solder the harness disconnected in (2) of step 5 to a new motor.

Note

Solder a red harness to marking "+" of the motor.



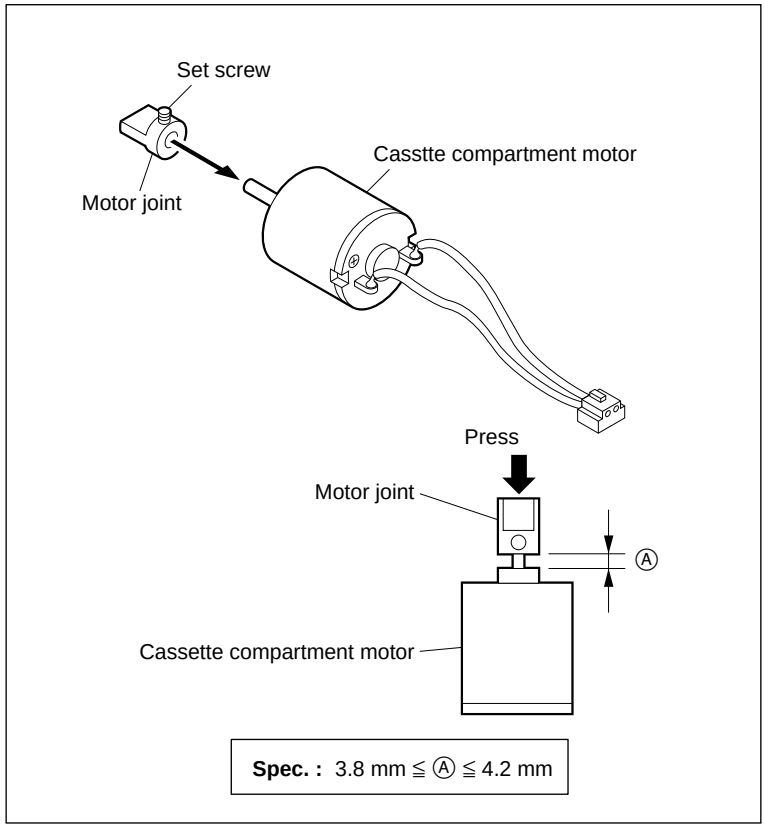
Harness Soldering

7. Attach the Motor Joint

(1) Pass the motor joint through the shaft of the motor and temporarily tighten the set screw.

(2) Confirm that the clearance between the motor joint and motor satisfies the specification when the motor joint is pushed toward the motor and tighten the set screw.

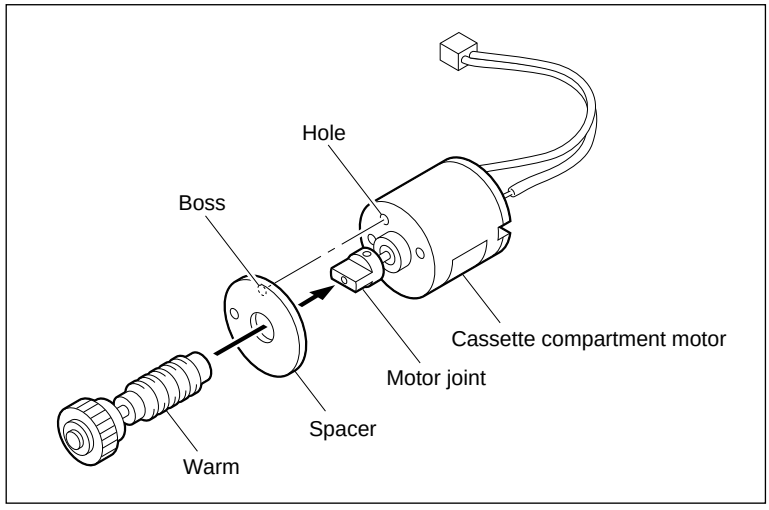
Tightening torque: 60×10^{-2} N • m
{6 kgf • cm}



Attach the Motor Joint

8. Attach the Spacer and Warm

(1) Put the boss of the spacer in the hole of the motor.
(2) Align the warm with the motor joint, then insert it.



Attach the Spacer and Warm

9. Install the Cassette Compartment Motor

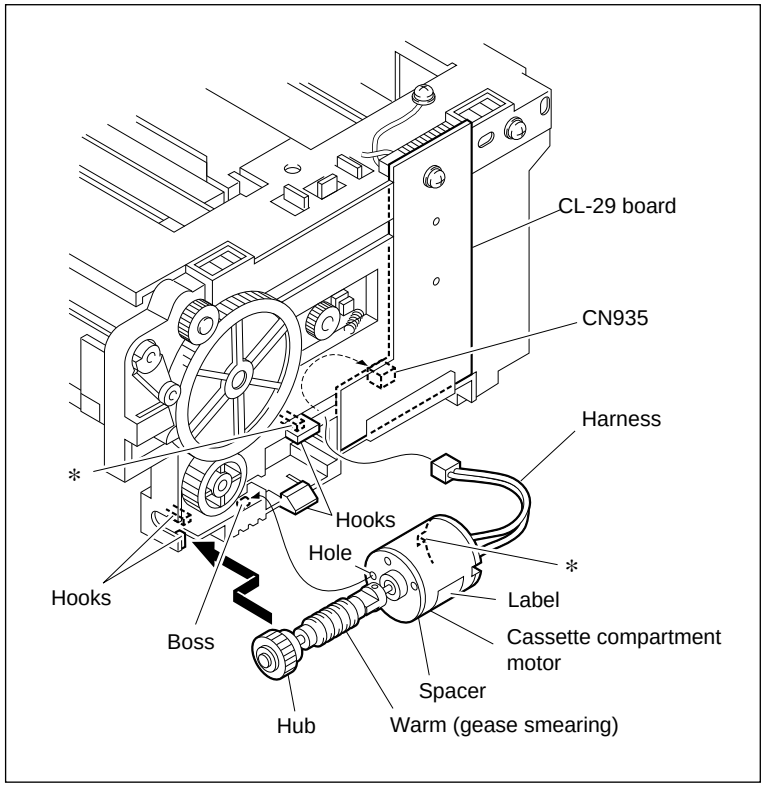
(1) Put the motor in the direction shown in the figure and pass the harness through the hole of the chassis.
(2) Place the ∗-marked portion of the motor shown in the figure and put the motor in the two hooks while inserting the hole of the spacer into the boss of the chassis. Simultaneously, put the hub of the warm in the two hooks of the chassis.
(3) Confirm that the motor has been fixed.

10. Apply the Grease

(1) Wipe the grease on the warm and clean it.
(2) Slightly apply the grease to the warm.

11. Connect the Harness

Connect the harness of the cassette comportment motor to connector CN935 on the CL-29 board.



Attach the Cassette Compartment Motor

Adjustment after Replacement

12. Check the Cassette Compartment Motor Operation

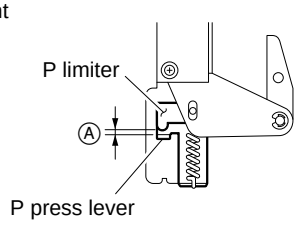
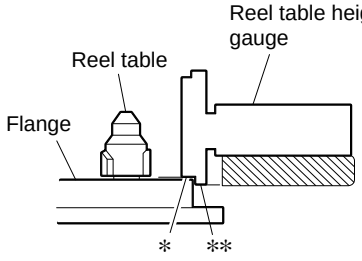
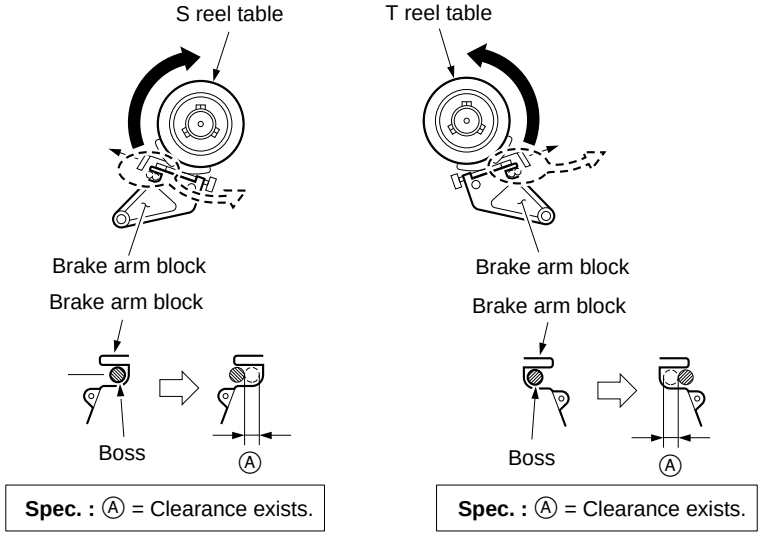
Refer to Section 3-2-2.
(C013: CASSETTE COMP.)

Note

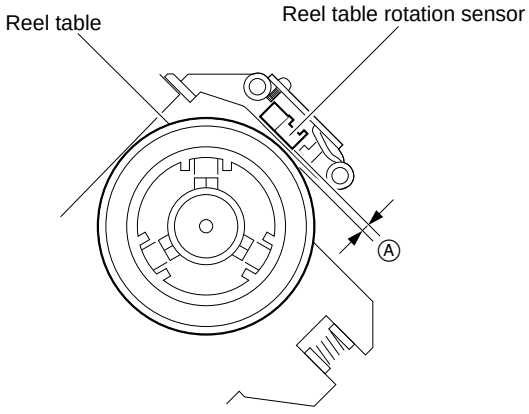
Perform this check with the cassette compartment installed in the unit.

5-27. Mechanical Adjustment Table

Index

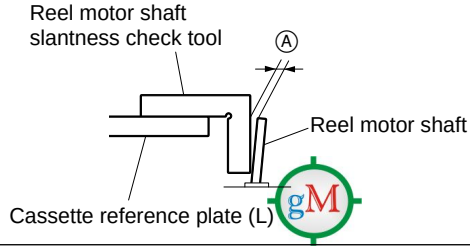
Adjustment	Specification	Page
Pinch Press Clearance Adjustment	 **Spec. :** Ⓐ = 0.6 to 0.8 mm	5-59
Reel Table Height Adjustment	 **Spec. :** The ∗ marked portion of the gauge slide over the frange of the reel table. The ∗∗ marked portion of the gauge does not slide over.	5-71
Reel Brake Clearance Check	 **Spec. :** Ⓐ = Clearance exists. **Spec. :** Ⓐ = Clearance exists.	5-74
Reel Brake Release Amount Adjustment	**Spec. :** The brake lining does not touch a reel table while reel table rotatong.	5-75

Adjustment	Specification	Page
Reel Table Rotation Sensor Position Adjustment		5-77



Spec. : Ⓐ = 0.1 mm or more

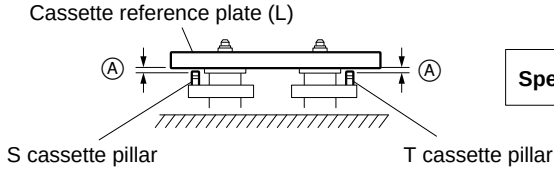
Reel Motor Shaft Slantness Adjustment		5-92



Spec. 1 : (L cassette position)
Ⓐ ≦ 0.03 mm

Spec. 2 : (S cassette position)
Ⓐ ≦ 0.1 mm

Cassette Pillar Height Adjustment		5-95

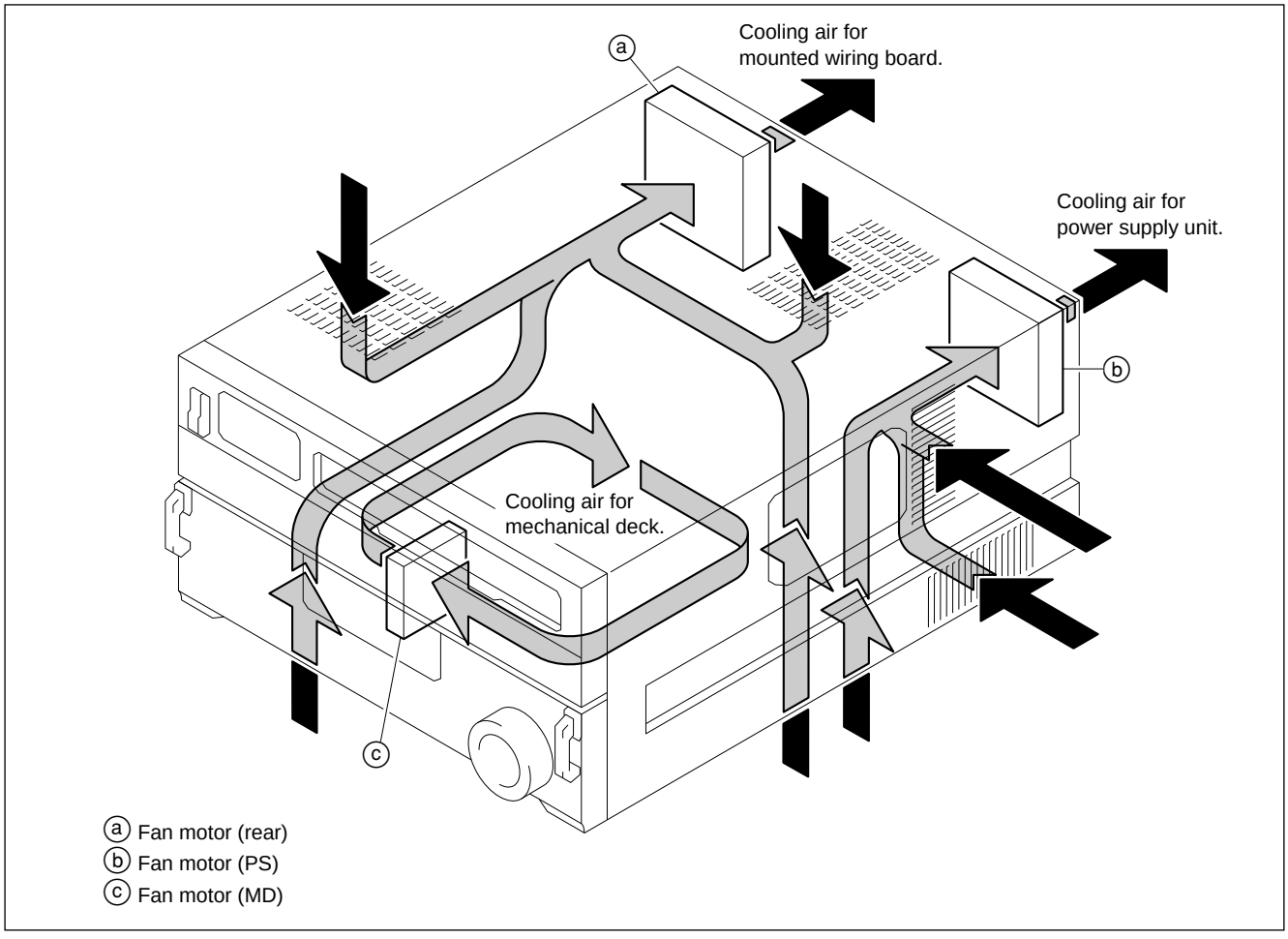


Spec. : Ⓐ = No clearance exists.

5-28. Fan Motor Replacement

This unit has three fan motors. Replace each fan motors every 40,000 hours of energizing.

1. Index



2. Notes

- Replace the fan motors when displaying a alarm informing for fan motor in addition to the periodic replacement.
- When the fan motor stops because of trouble, some components inside the unit may be heated to high temperatures.
  Take care not to burn your hands by touching these components.
  In service operation, turn off the power and perform the service operation after the temperatures turns to ordinary state.

5-28-1. Fan Motor (Rear) Replacement

Outline

Replacement

1. Remove the Connector Panel
2. Remove the Fan Motor (Rear)
3. Attach the Fan Motor (Rear)
4. Attach the Connector Panel

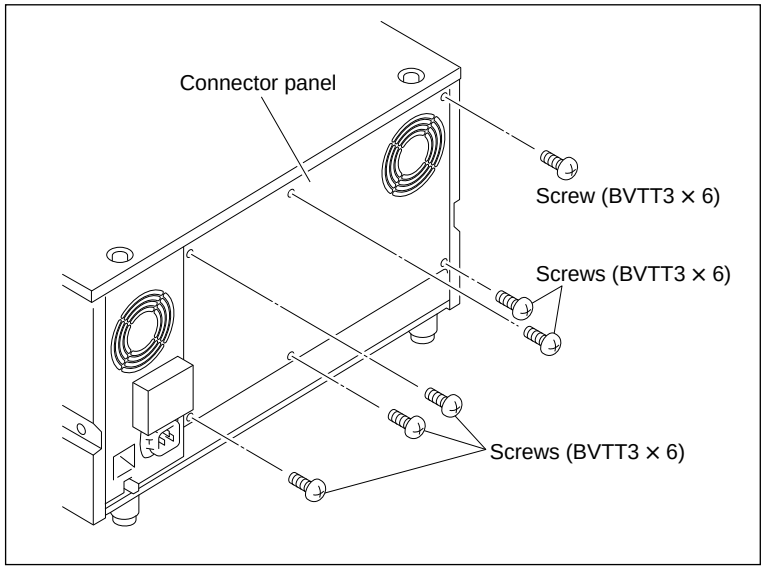
Removal

1. Remove the Connector Panel

Remove the six screws and remove the connector panel.

Note

It is not neccessary to disconnect the harnesses connected to the connector panel.



Remove the Connector Panel

2. Remove the Fan Motor (Rear)

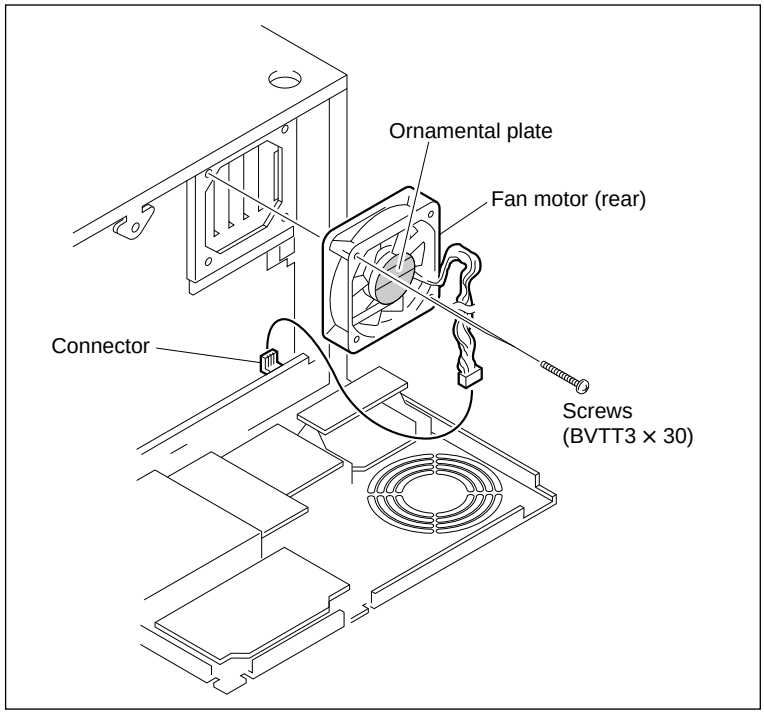
(1) Disconnect the harness of the fan motor (rear) from the connector shown in the figure.
(2) Remove the two screws and remove the fan motor (rear).

3. Attach the Fan Motor (Rear)

(1) Attach a new fan motor (rear) so that the ornamental plate faces to outside and harness is bottom right side, and tighten the two screws.
(2) Connect the harness of the fan motor (rear) to the connector.

4. Attach the Connector Panel

Attach the connector panel with the six screws.



Remove/Attach the Fan Motor (Rear)

5-28-2. Fan Motor (PS) Replacement

Outline

Replacement

1. Remove the Power Supply Panel Assembly
2. Remove the Fan Motor (PS)
3. Attach the Fan Motor (PS)
4. Attach the Power Supply Panel Assembly

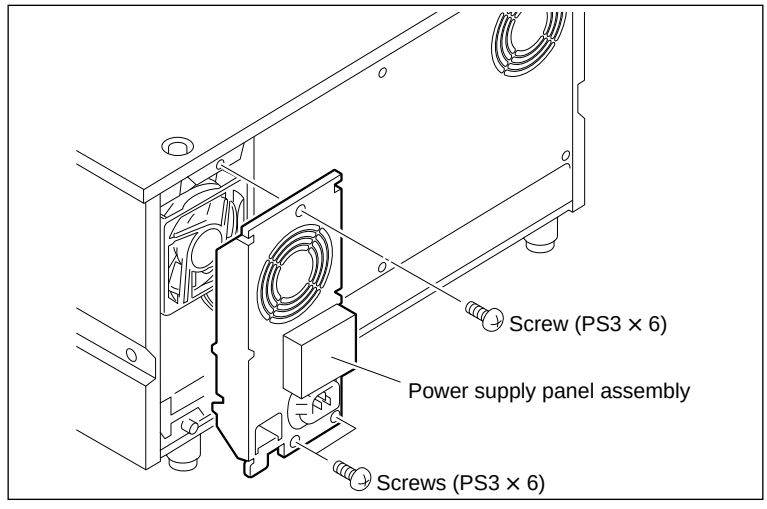
Removal

1. Remove the Power Supply Panel Assembly

Remove the three screws and remove the power supply panel assembly.

Note

It is not neccessary to disconnect the harness connected to the power supply panel assembly.



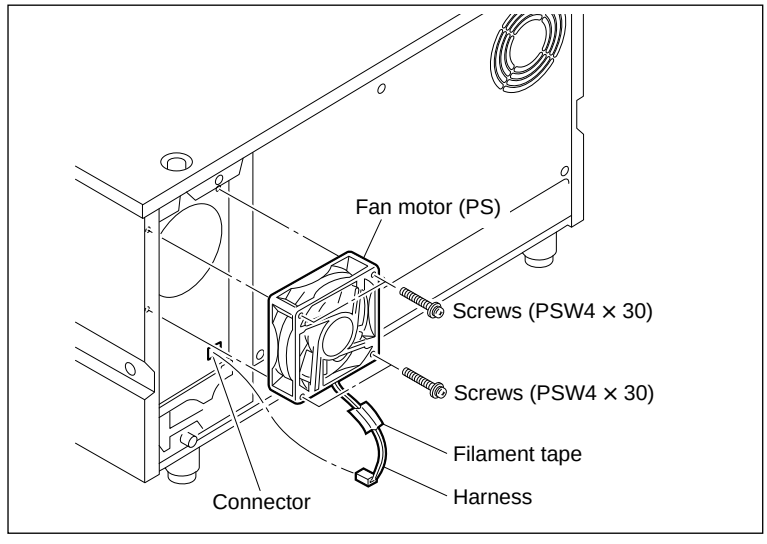
Remove the Power Supply Panel Assembly

2. Remove the Fan Motor (PS)

(1) Take off the filament tape fixing the harness of the fan motor (PS).
(2) Disconnect the harness of the fan motor (PS) from the connector shown in the figure.
(3) Remove the four screws and remove the fan motor (PS).

3. Attach the Fan Motor (PS)

(1) Attach a new fan motor (PS) so that the ornamental plate faces to outside and harness is bottom left side, and tighten the four screws.
(2) Connect the harness of the fan motor (PS) to the connector.
(3) Stick a filament tape to fix the harness of the fan motor (PS).



Remove/Attach the Fan Motor (PS)

4. Attach the Power Supply Panel Assembly

Attach the power supply panel assembly with the three screws.

5-28-3. Fan Motor (MD) Replacement

Outline

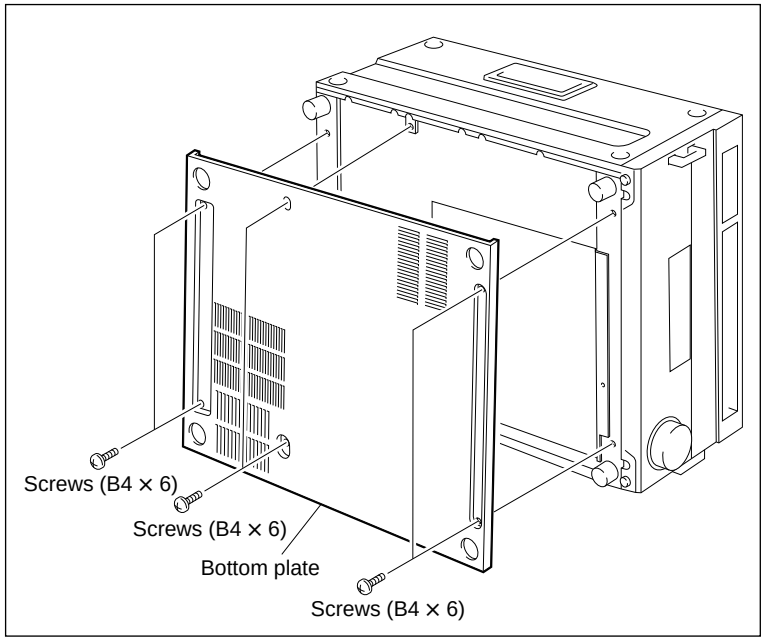
Replacement

1. Remove the Bottom Plate
2. Remove the Shield Plate (Bottom)
3. Replace the Fan Motor (MD)
4. Attach the Fan Motor (MD)
5. Attach the Shield Plate (Bottom)
6. Attach the Bottom Plate

Removal

1. Remove the Bottom Plate

(1) Place the unit on its right side panel down.
(2) Remove the six screws and remove the bottom plate.

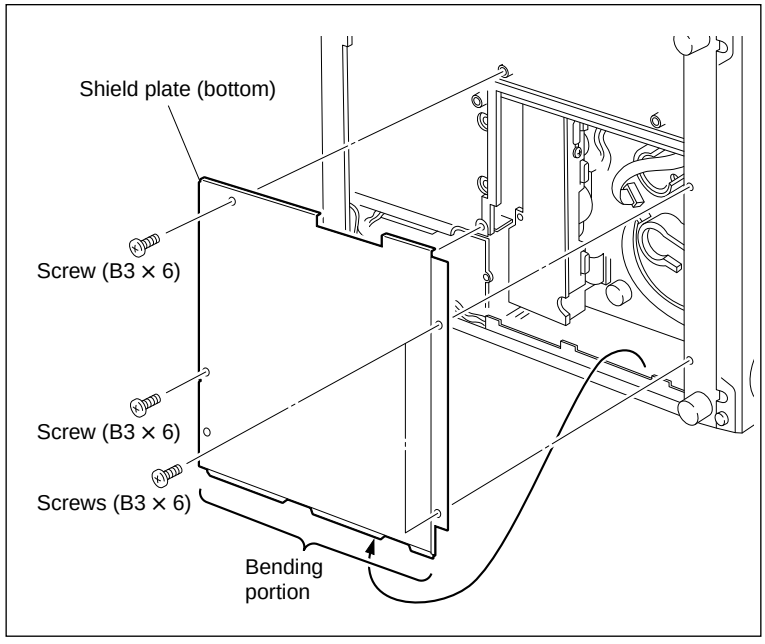


Remove the Bottom Plate

http://getMANUAL.com

2. Remove the Shield Plate (Bottom)

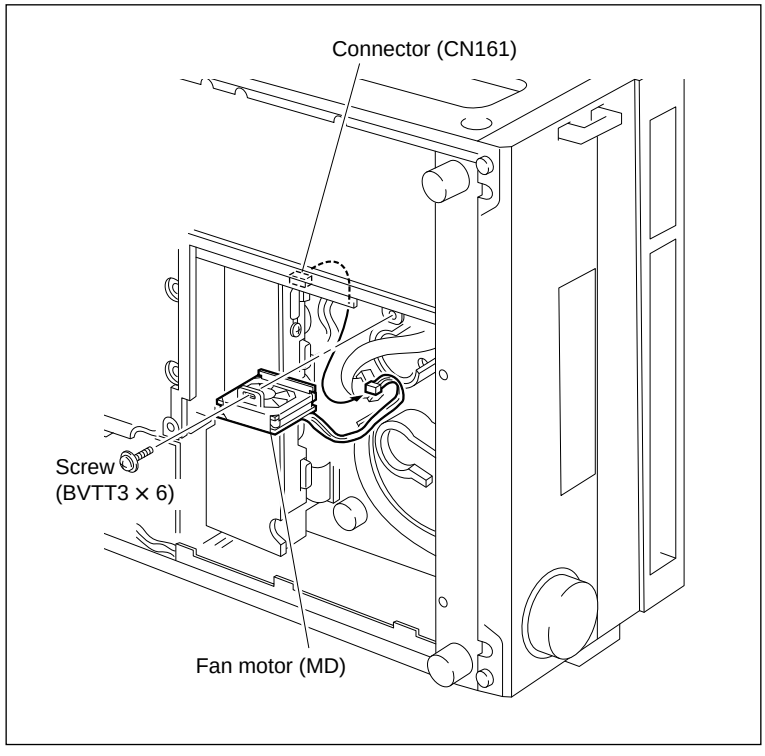
Remove the four screws, and then remove the shield plate (bottom).



Remove the Shield Plate (Bottom)

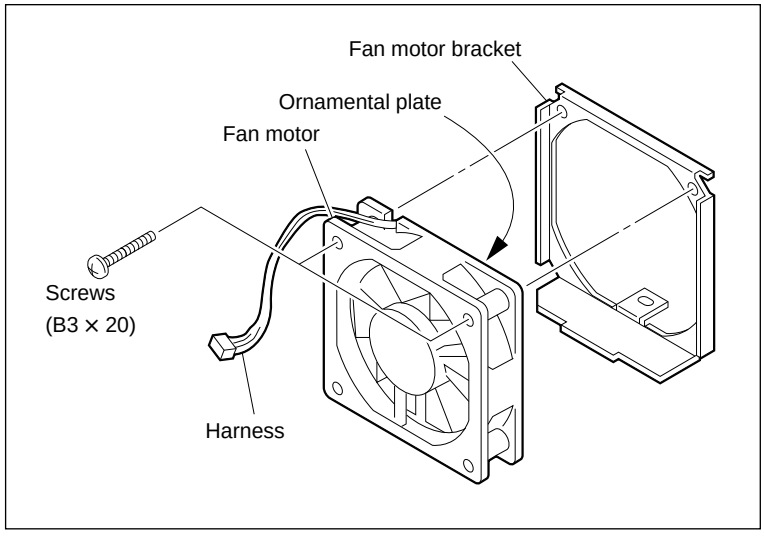
3. Replace the Fan Motor (MD)

(1) Disconnect the harness from the connector CN161 shown in the figure.
(2) Remove a screw and remove the fan motor (MD).



Replace the Fan Motor (MD)

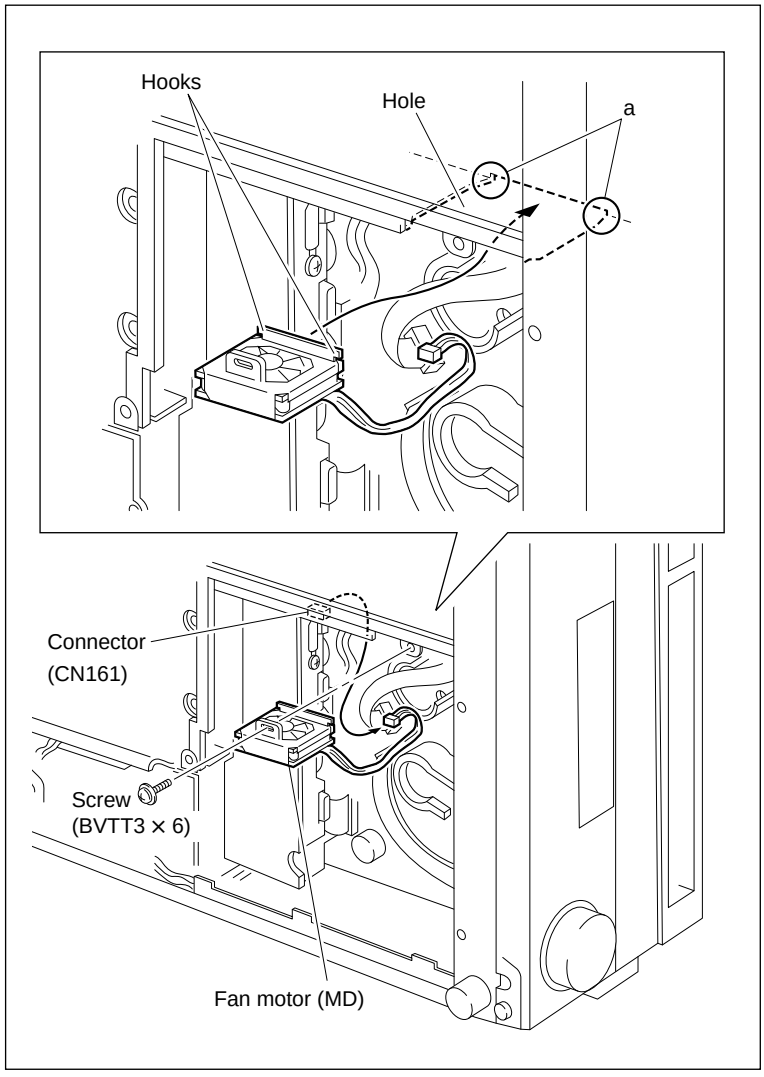
(3) Remove the two screws and remove the fan motor (MD) from the fan motor bracket.
(4) Attach the fan motor (MD) to the fan motor bracket so that the ornamental plate faces to side of the fan motor bracket and the harness is top left side, and tighten the two screws.



Replace the Fan Motor (MD)

4. Attach the Fan Motor (MD)

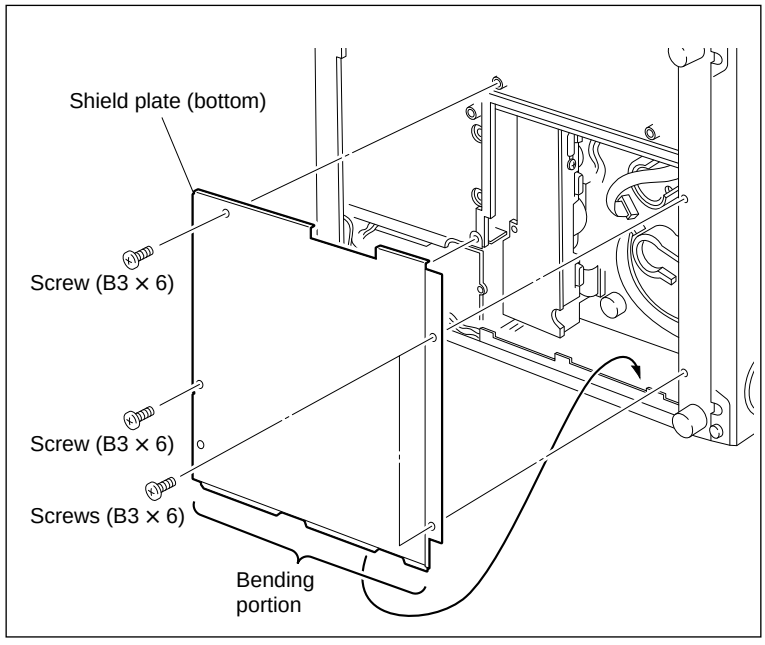
(1) Put the hook of the fan motor bracket to the portions “a” of the chassis.
(2) Attach the fan motor (MD) with the screw.
(3) Connect the harness of the fan motor (MD) to the connector (CN161).



Attach the Fan Motor (MD)

5. Attach the Shield Plate (Bottom)

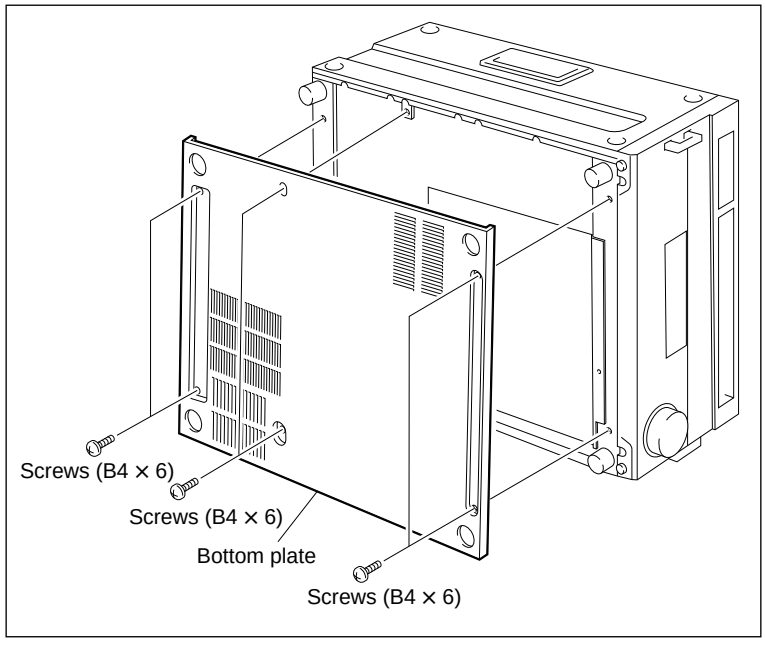
Attach the shield plate (bottom) with the four screws.



Attach the Shield Plate (Bottom)

6. Attach the Bottom Plate

Attach the bottom plate with the six screws.



Attach the Bottom Plate

5-29. Power Supply Unit Replacement

Outline

Replacement

1. Remove the Bottom Plate
2. Disconnect the Harnesses
3. Remove the Power Supply Panel Assembly
4. Remove the Power Supply Unit
5. Attach the Power Supply Unit
6. Attach the Power Supply Panel Assembly
7. Connect the Harnesses
8. Confirm the Output Voltage
9. Attach the Bottom Plate
10. Confirm the Operation

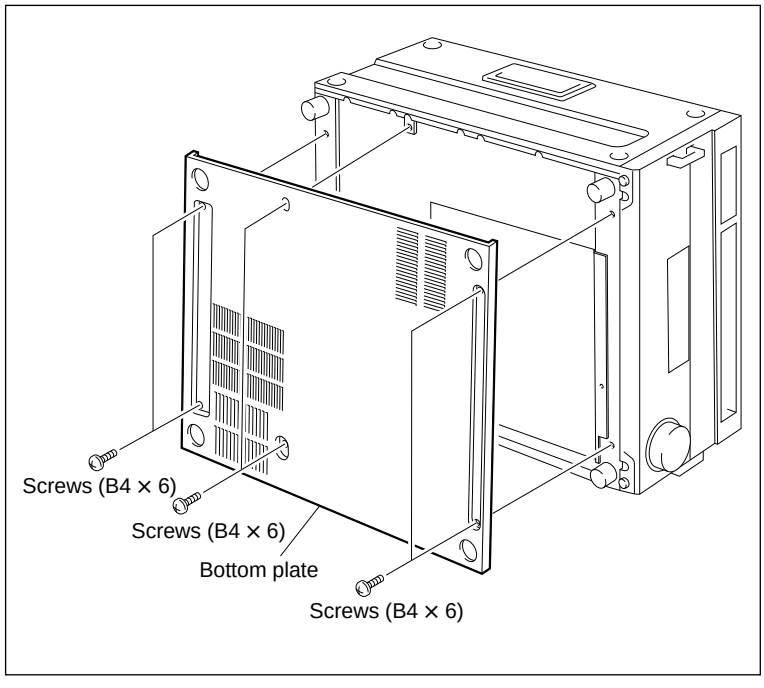
Preparation

1. Turn the power off and then wait over 30 seconds.
2. Remove the power supply cord plug from the outlet.

Removal

1. Remove the Bottom Plate

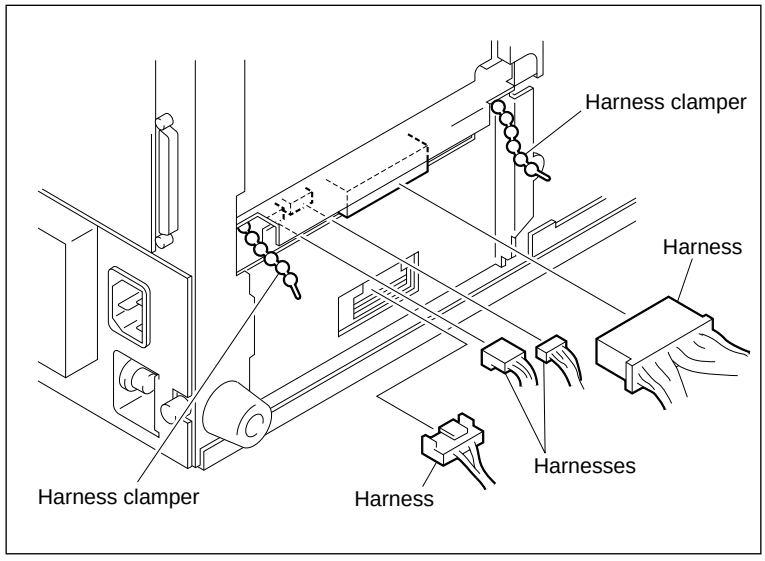
(1) Place the unit on its right side panel down.
(2) Remove the six screws and remove the bottom plate.



Remove the Bottom Plate

2. Disconnect the Harnesses

(1) Release the two harness clampers as shown in the figure.
(2) Disconnect the four harnesses.



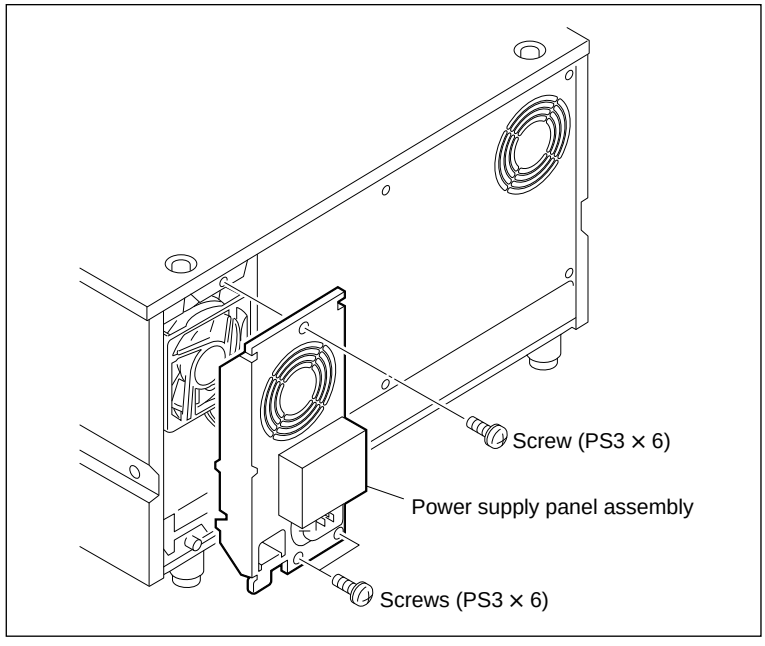
Disconnect the Harnesses

3. Remove the Power Supply Panel Assembly

Remove the three screws and open the power supply panel assembly.

Note

It is not necessary to disconnect the harness connected to the power supply panel assembly.



Remove the Power Supply Panel Assembly

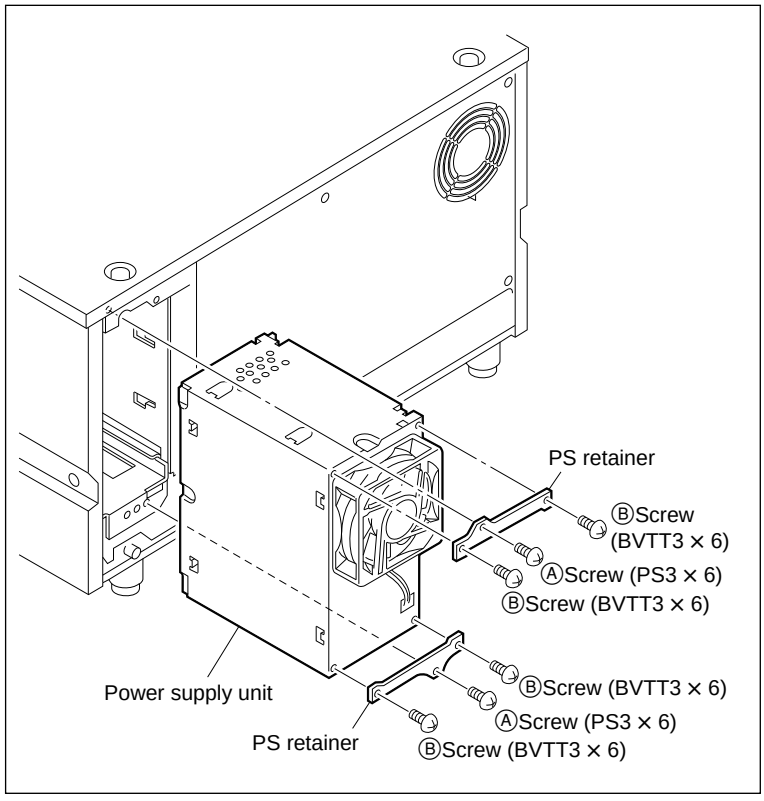
4. Remove the Power Supply Unit

(1) Remove the two screws (Ⓐ).
(2) Pull out the power supply block.

Installation

5. Attach the Power Supply Unit

(1) Remove the four screws (Ⓑ) and remove the two PS retainers.
(2) Attach the two PS retainers to a new power supply unit with the four screws (Ⓑ).
(3) Insert the power supply unit, fix it with the two screws (Ⓐ).



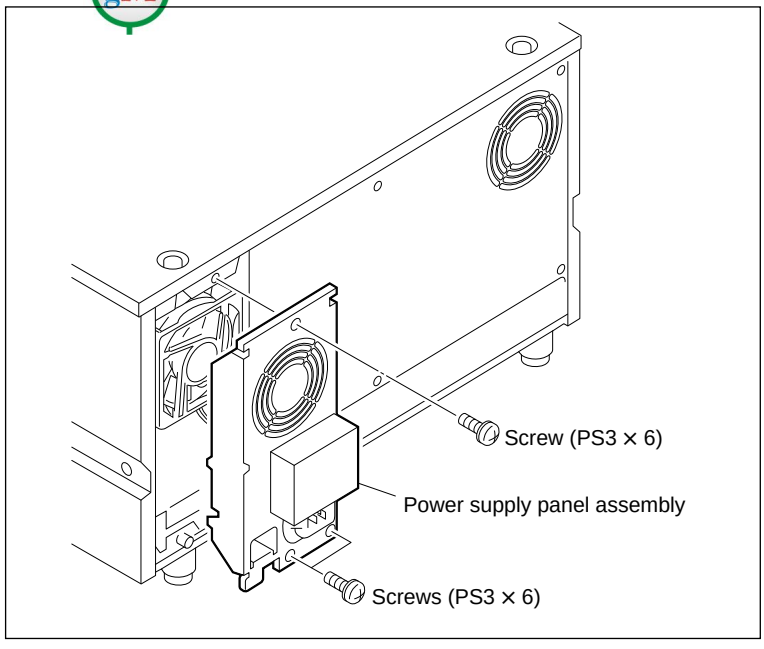
Remove/Attach the Power Supply Unit

6. Attach the Power Supply Panel Assembly

Attach the power supply panel assembly with the three screws.

Note

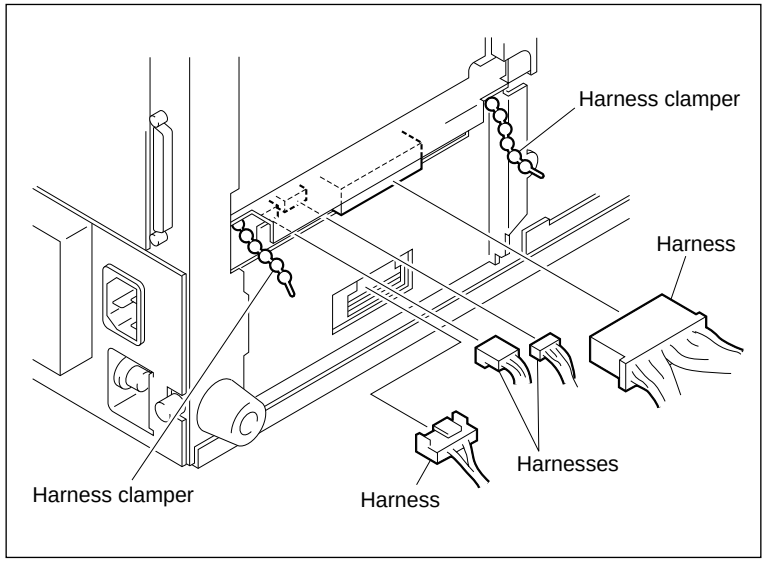
Be careful not to catch the harness.



Attach the Power Supply Panel Assembly

7. Connect the Harnesses

(1) Connect the each harness to the four connectors shown in the figure.
(2) Hold the harnesses using the a harness clampers.



Connect the Harnesses

8. Confirm the Output Voltage

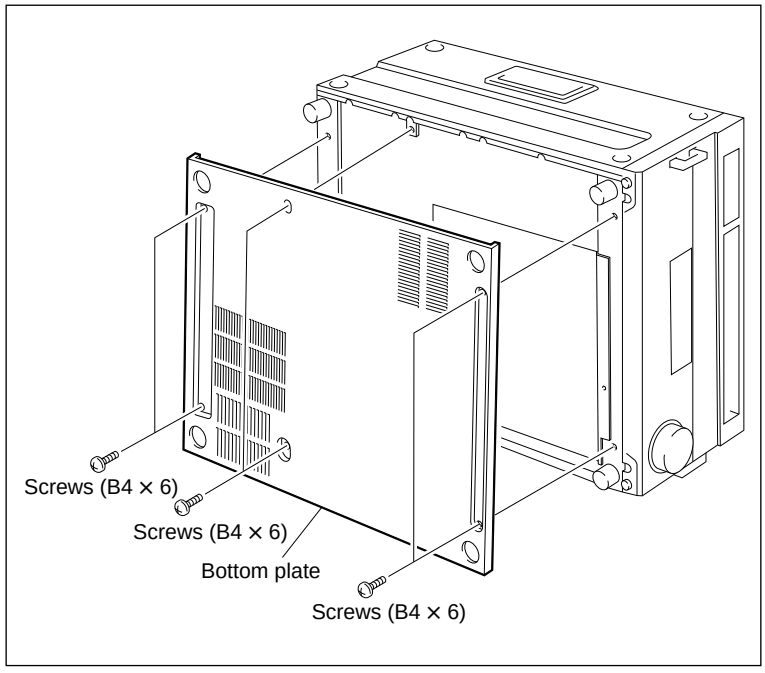
Refer to Section 4-2-1.

9. Attach the Bottom Plate

(1) Attach the bottom plate with the six screws.
(2) Put the unit back.

10. Confirm the Operation

Turn the power on and confirm the unit runs in normal condition.



Attach the Bottom Plate

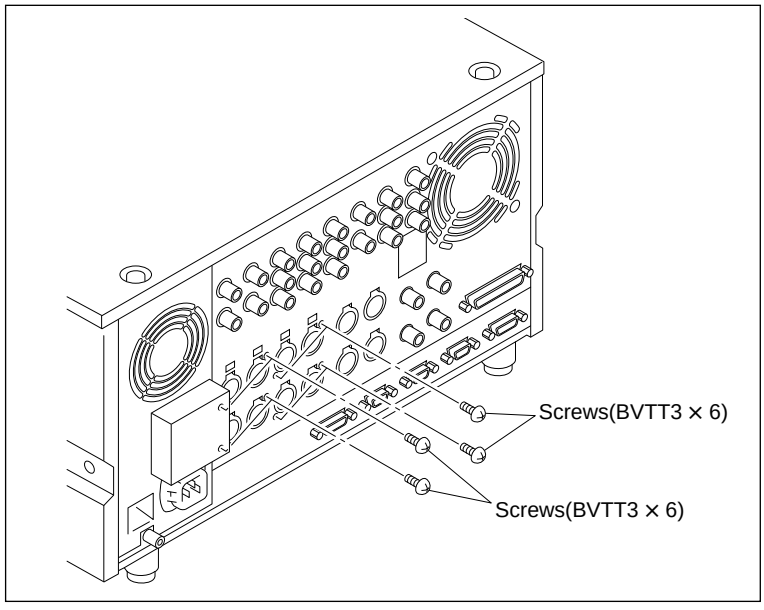
5-30. Mounted Circuit Board Replacement

This section explains each replacement procedure of circuit boards except plug-in boards.
Refer to Sections 1-13 and 1-25 for piug-in board replacement.

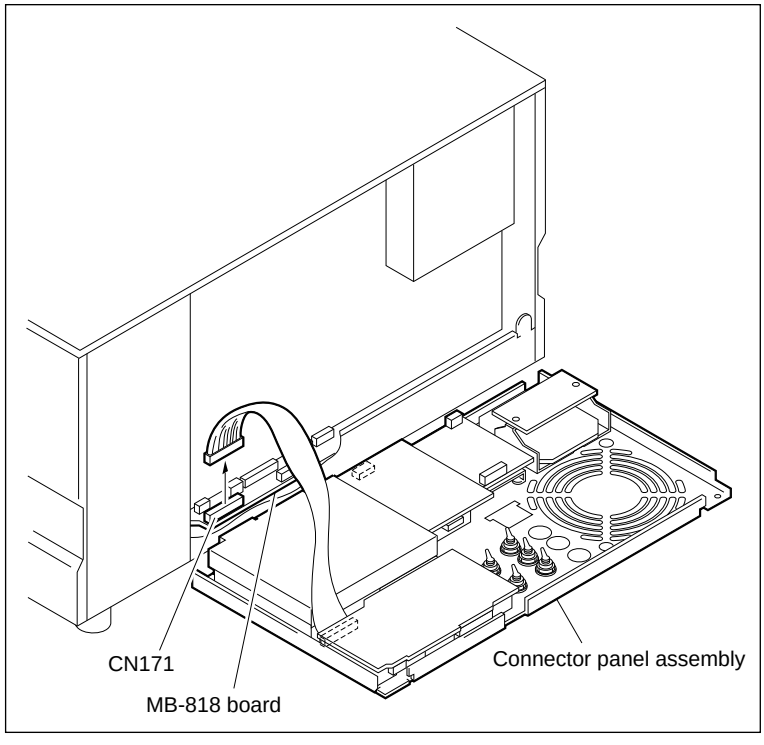
5-30-1. CP-278 Board

Replacement

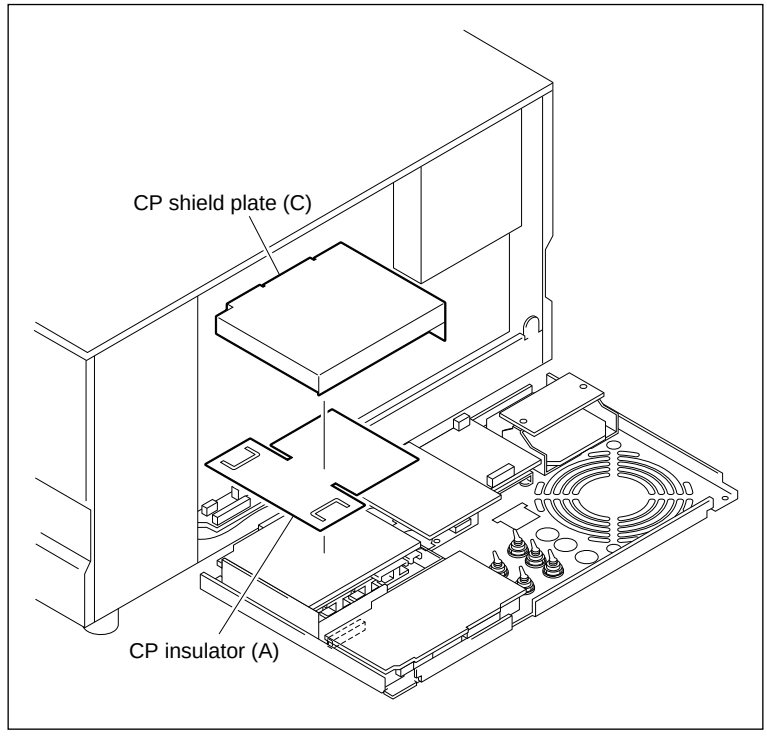
1. Turn the power off.
2. Remove the eight screws (BVTT 3 × 6).



3. Remove the connector panel assembly. (Refer to step 1 of Section 5-28-1.)
4. Disconnect the harness from the connector CN171 on the MB-818 board.



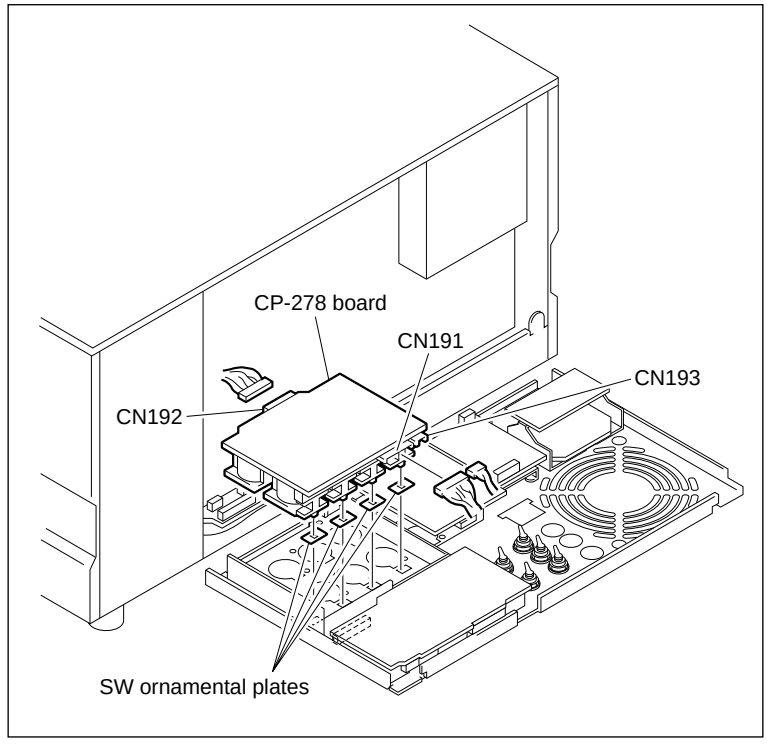
5. Remove the CP shield plate (C) and CP insulator (A).



6. Disconnect the harnesses from the connectors (CN191, CN192, and CN193) on the CP-278 board, then remove the CP-278 board.

Note

In this way the four SW ornamental plates will remove.
Be carefull not to lose them.



7. Install the CP-278 board in the reverse order of steps 2 through 6.

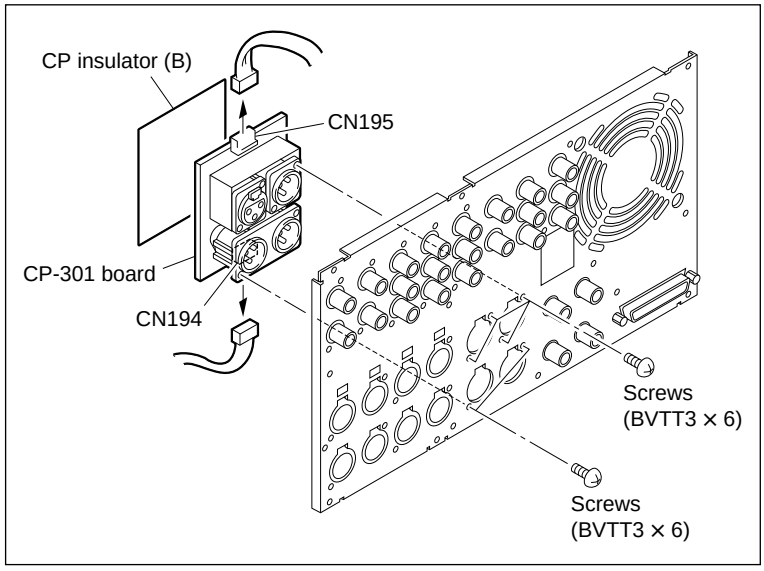
Confirmation after Replacement

Confirm the input/output level of each analog audio channel.
(Refer to Section 1-25-5.)

5-30-2. CP-301 Board

Replacement

1. Turn off the power.
2. Remove the connector panel assembly. (Refer to step 1 of Section 5-28-1.)
3. Remove the six screws as shown in the figure.
4. Disconnect the hernesses from the connectors (CN194 and CN195) on the CP-301 board, then remove the CP-301 board.
5. Peel off the CP insulator (B).



6. Install the CP-301 board in the reverse order or steps 2 through 5.

Note

Adjustment after replacement is not required.

5-30-3. CP-334 Board

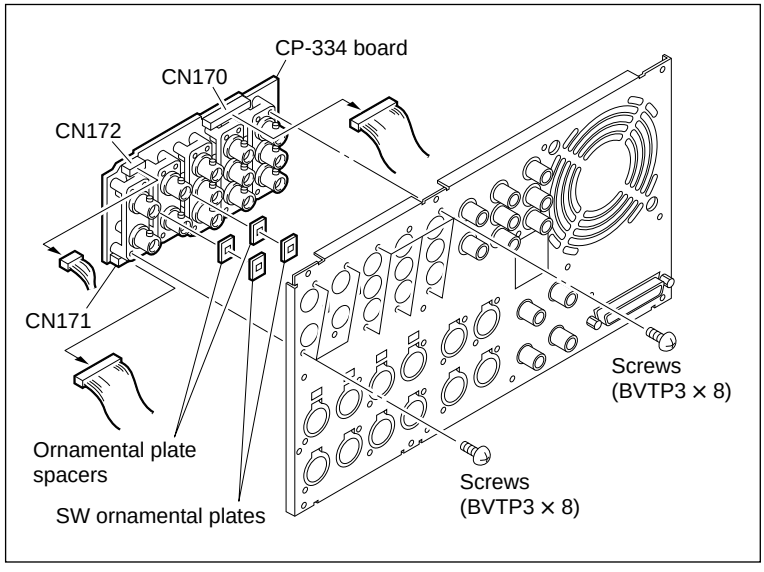
Replacement

1. Turn the power off.
2. Remove the connector panel assembly. (Refer to step 1 of Section 5-28-1.)
3. Remove the ten screws shown in the figure.
4. Disconnect the harnesses from the connectors (CN170, CN171, and CN172) on the CP-334 board, then remove the CP-334 board.

   Note

   Two SW ornamental plates and two ornamental plate spacers can be removed in this case.
   Be careful not to lose them.

5. Install the CP-334 board in the reverse order of steps 2 through 4.



Confirmation after Replacement

6. Confirm that the composite/component video output signals are normal. (Refer to Section 1-25-7.)

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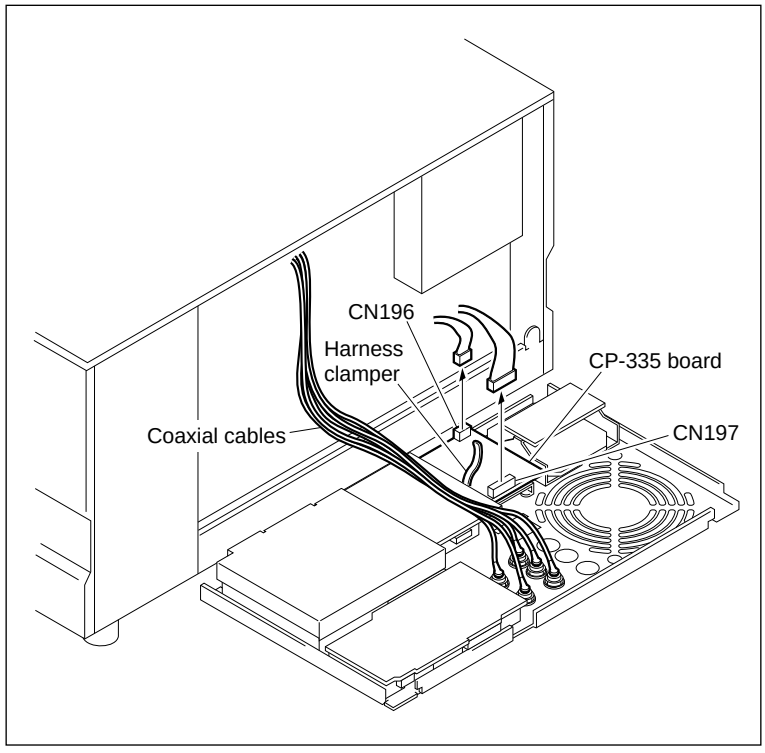
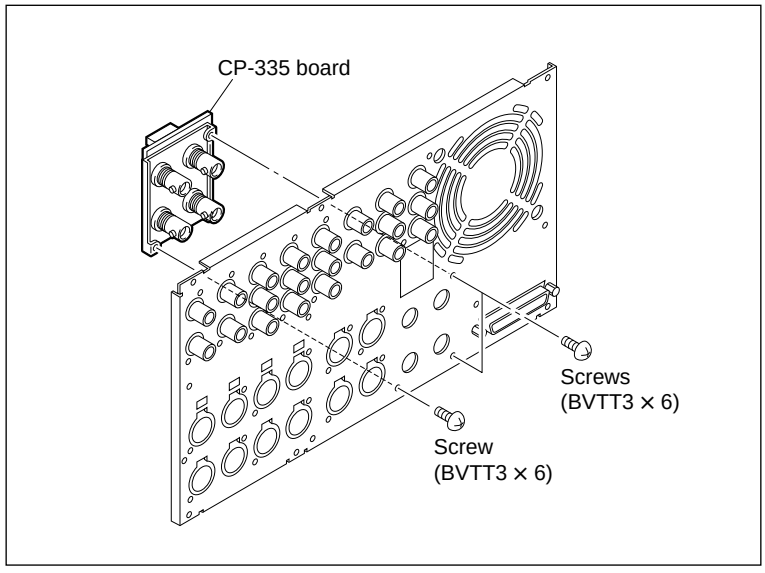
5-30-4. CP-335 Board

Replacement

1. Turn off the power.
2. Remove the connector panel assembly. (Refer to step 1 of Section 5-28-1.)
3. Strech the harness clamper and release the coaxial cables.
4. Disconnect the harnesses from the connectors (CN196 and CN197) on the CP-335 board.



5. Remove the three screws as shown in the figure, then remove the CP-335 board.



6. Install the CP-335 board in the reverse order of steps 2 through 5.

Confirmation after Replacement

7. Confirm the input/output level of each AES/EBU channel. (Refer to Section 1-25-8.)

5-30-5. DR-315 Board

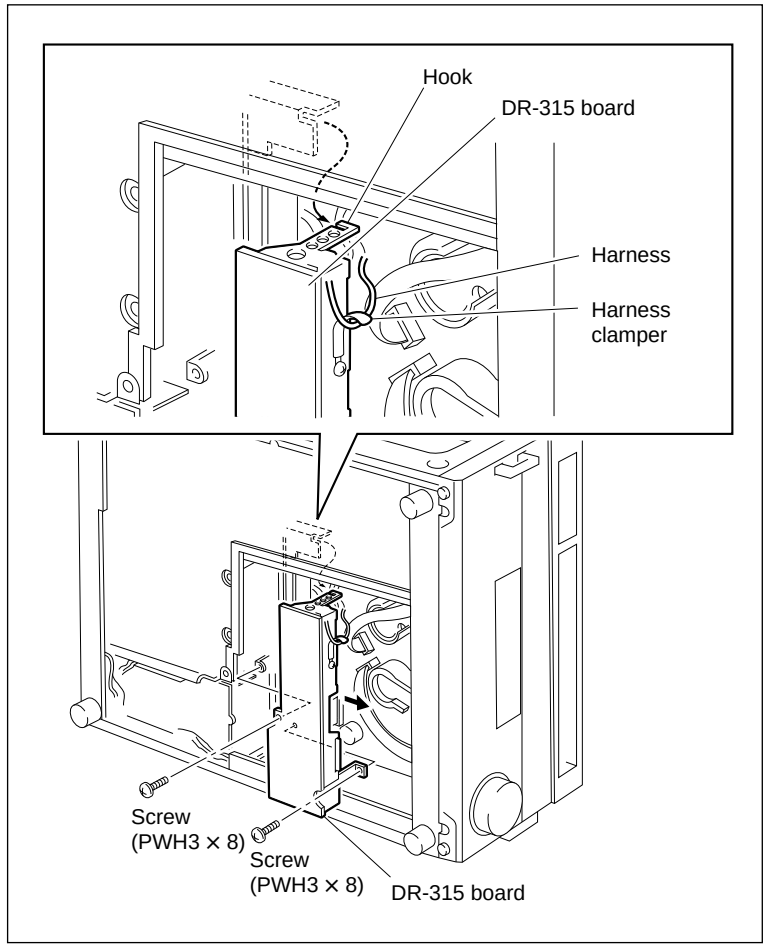
Replacement

1. Turn off the power.
2. Put the unit with the right side panel down and remove the bottom plate.
   (Refer to step 1 of Section 5-28-3.)
3. Remove the shield plate (bottom).
   (Refer to step 2 of Section 5-28-3.)
4. Stretch the harness clamper on the DR-315 board and release the harness.
5. Remove the two screws shown in the figure.
6. Move the DR-315 board toward the reel motors, and detach the hook.

   Note

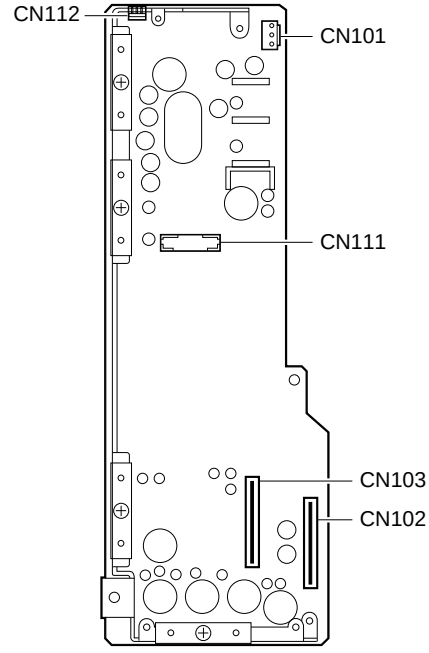
   The hook is hard to be seen since it is the inner part.

7. Pull out the DR-315 board as far as possible as shown in the figure.



8. Disconnect the hernesses and the flexible boards from the connectors (CN101, CN102, CN103, CN111 and CN112) on the DR-315 board, then remove the DR-315 board.

<DR-315 board, side A>



9. Install the DR-315 board in the reverse order of steps 2 through 8.

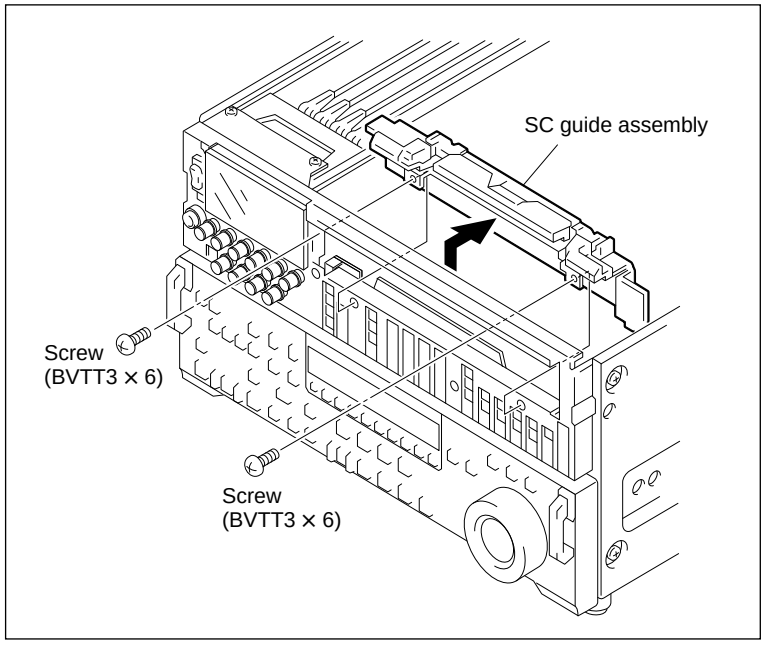
Adjustment after Replacement

10. Perform the electrical adjustment in servo system.
(Refer to Sections 4-4-3 and 4-4-5.)

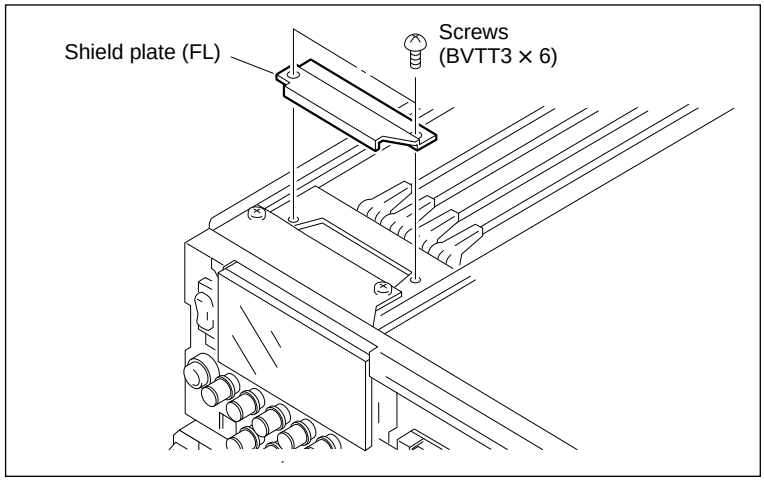
5-30-6. FP-117 Board

Replacement

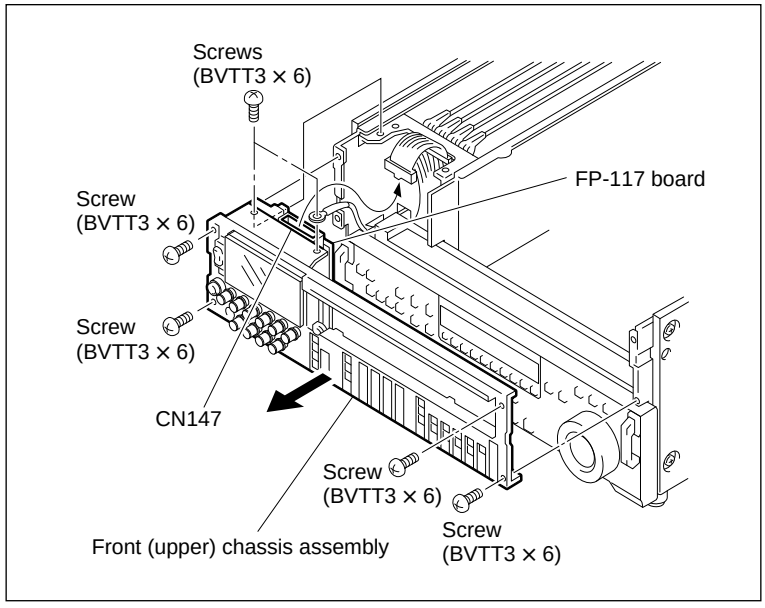
1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 1-3-1.)
3. Remove the plate MD assembly.
   (Refer to Section 1-4.)
4. Remove the cassette compartment assembly.
   (Refer to Section 1-5.)
5. Remove the upper control panel.
   (Refer to Section 1-3-2.)
6. Remove the two screws, then remove the SC guide assembly.



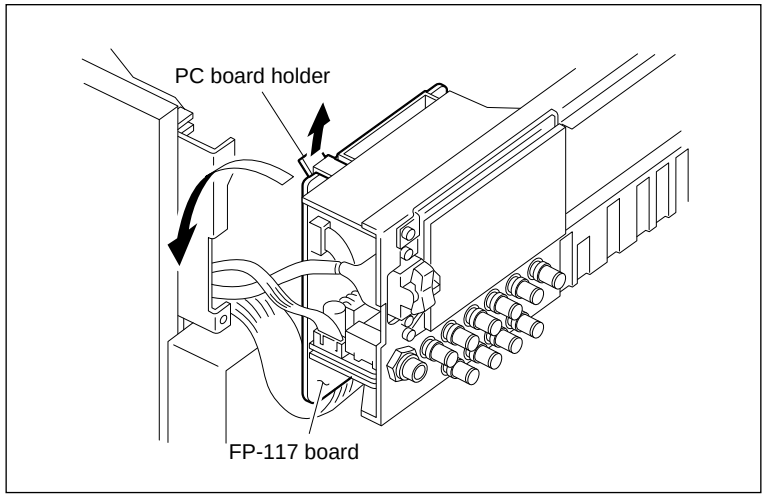
7. Remove the two screws, and then remove the shield plate (FL).



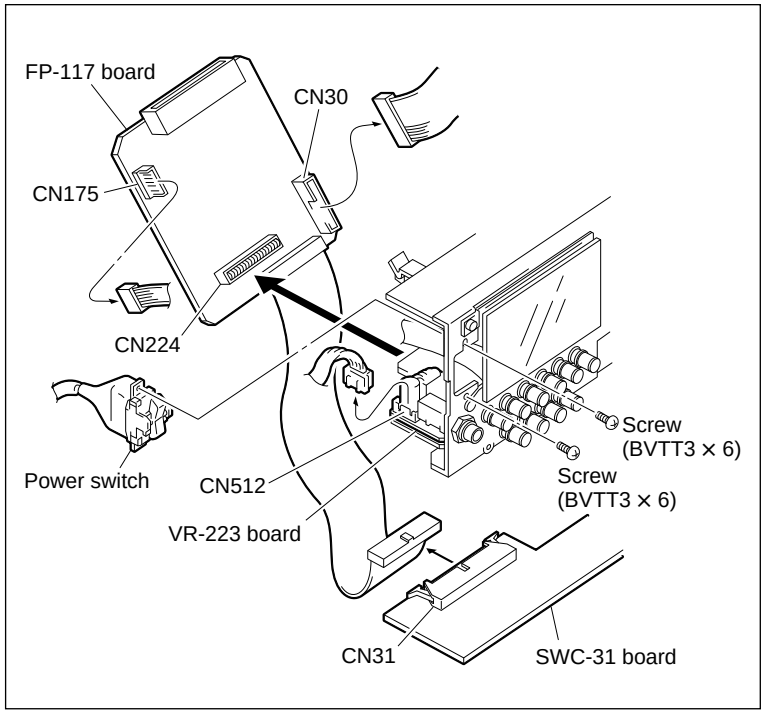
8. Disconnect the flat cable from the connector CN147 on the FP-117 board.
9. Remove the six screws, then pull out the front (upper) chassis assembly.



10. Undo the PC board holder, then open the FP-117 board.



11. Remove the two screws, then remove the power switch.
12. Disconnect the flat cable from the connector CN30 on the FP-117 board.
13. Disconnect the harnesses and the flat cables from the connector (CN512) on the VR-223 board, connectors (CN175 and CN31) on the FP-117 board, and remove the front (upper) chassis assembly.
14. Disconnect the harness from the connector CN224 on the FP-117 board, then remove the FP-117 board.



15. Install the FP-117 board in the reverse order of steps 2 through 14.

Notes

When connecting the connector CN224, put the protrusions of the connector on the VR-224 board in the hollow of CN224, then put the FP-117 board vertically.

Adjustment after Replacement

16. Perform the remote control offset adjustment. (Refer to Section 4-10.)

5-30-7. KY-438 Board

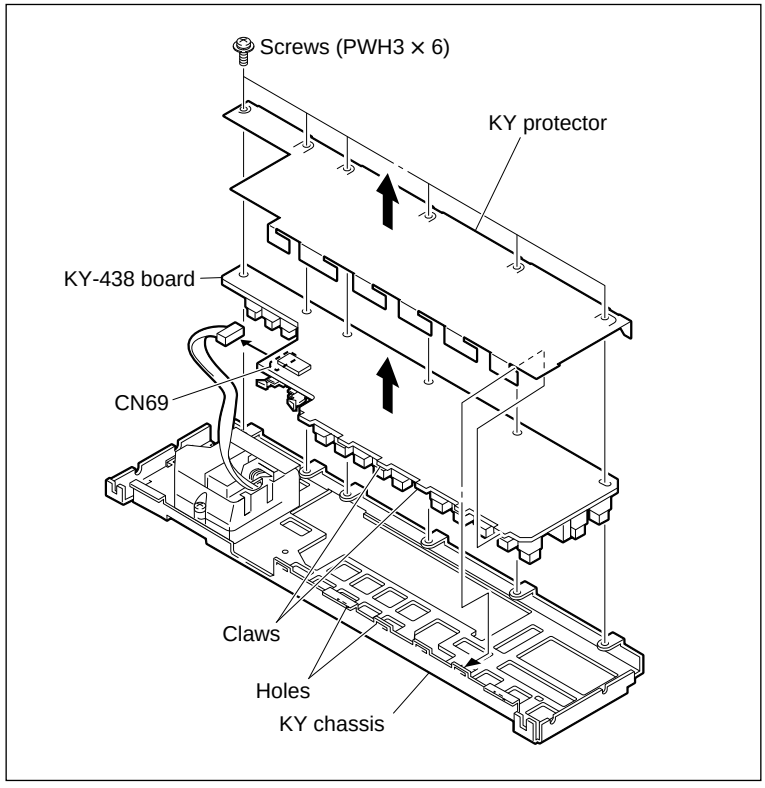
Replacement

1. Turn off the power.
2. Remove the lower control panel assembly. (Refer to Section 1-6.)
3. Remove the six screws shown in the figure, then remove the KY protector and KY-438 board.

   Note

   While pulling out the claws of the KY-438 board from the holes of the KY chassis, remove the KY protector and KY-438 board simultaneously.

4. Disconnect the harness from the connector CN69.



5. Install the KY-438 board in the reverse order of steps 2 through 4.

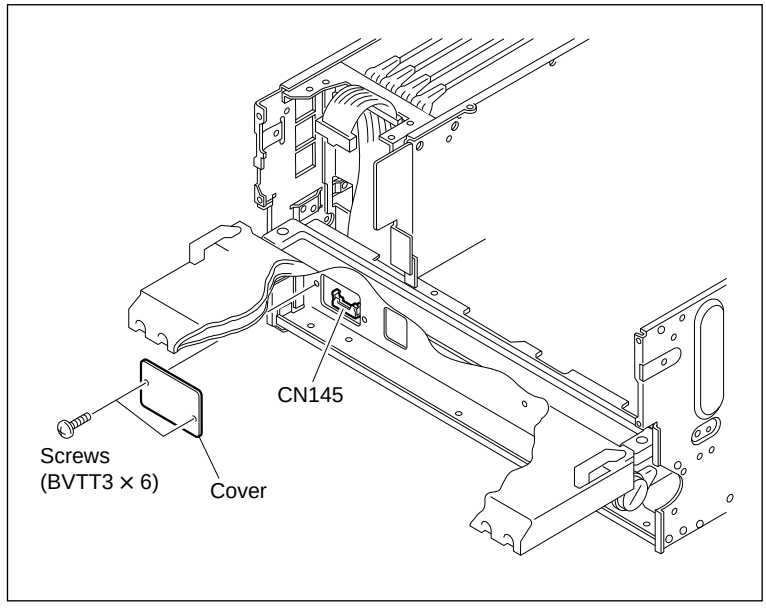
Note

Adjustment after replacement is not required.

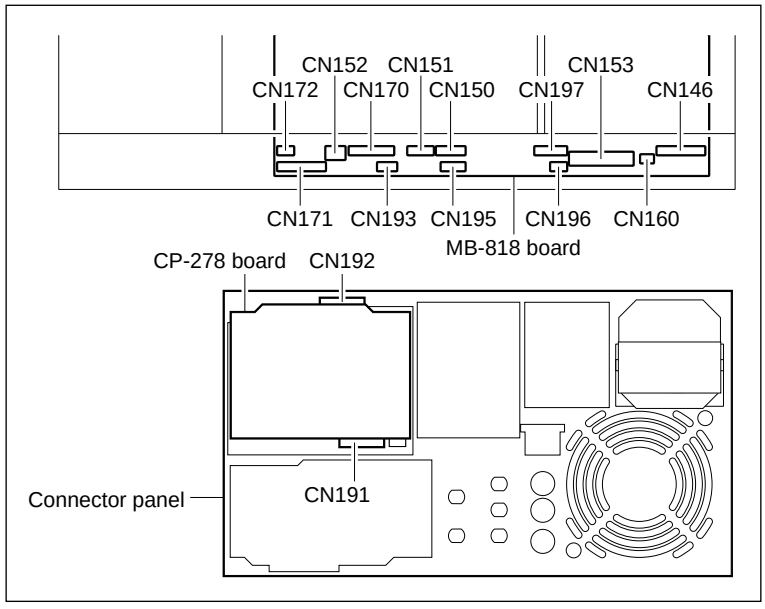
5-30-8. MB-818 Board

Replacement

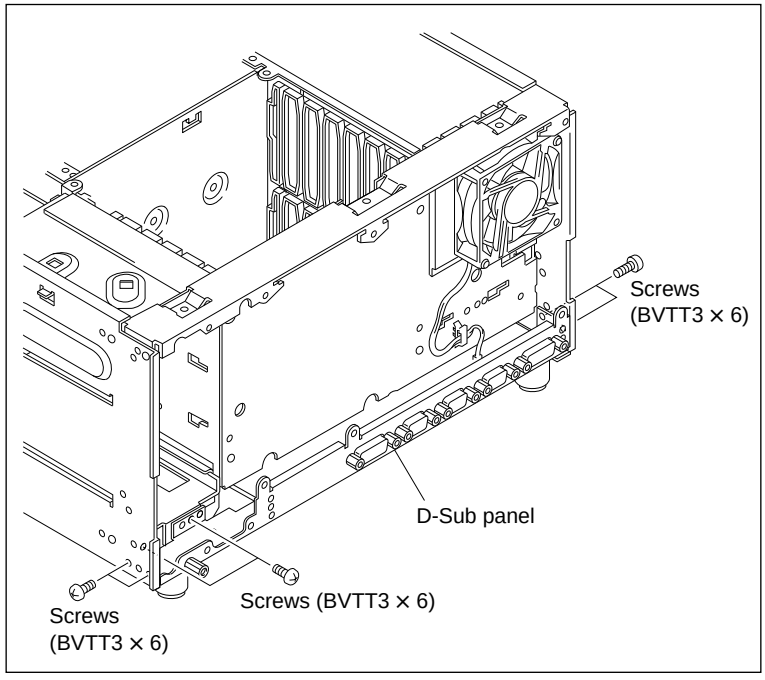
1. Turn off the power.
2. Remove the upper lid.
   (Refer to the Section 1-3-1.)
3. Remove the plate MD assembly.
   (Refer to Section 1-4.)
4. Remove the cassette compartment assembly.
   (Refer to Section 1-5.)
5. Remove the upper control panel.
   (Refer to Section 1-3-2.)
6. Remove the FP-117 board.
   (Refer to Section 5-30-6.)
7. Pull out the all plug-in boards.
   (Refer to Section 1-13.)
8. Remove the right side panel.
   (Refer to Section 1-3-1.)
9. Remove the left side panel.
   (Refer to Section 1-3-1.)
10. Remove the two screws, and then remove the cover.
11. Disconnect the flat cable from connector CN145 on the MB-818 board.
12. Remove the power supply panel assembly.
    (Refer to step 1 of Section 5-28-2.)



13. Remove the connector panel assembly.
    (Refer to step 1 of Section 5-28-1.)
14. Disconnect the harnesses from the connectors below on the MB-818 board.
    - Power supply unit harnesses
      CN150, CN151, CN152, and CN153
    - Connector panel harnesses
      CN146, CN170, CN171, CN172, CN193, CN195, CN196, and CN197
    - Fan motor (rear) harness
      CN160
15. Disconnect the harnesses from the connectors CN191 and CN192 on the CP-278 board.
    (Refer to Section 5-30-1.)

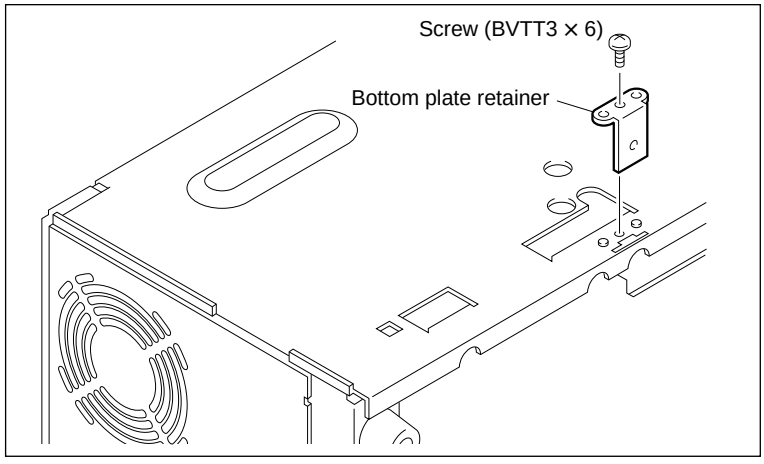


16. Remove the six screws fixing the D-Sub panel.

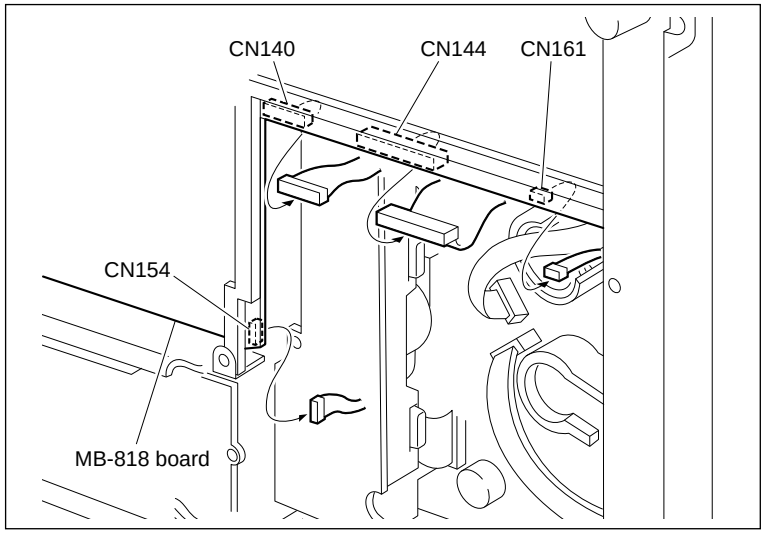


17. Put the unit with the right side plate down and remove the bottom plate.
    (Refer to step 1 of Section 5-28-3.)
18. Remove the four screws, and then remove the shield plate (bottom).
    (Refer to step 2 of Section 5-28-3.)

19. Remove the screw and remove the bottom plate retainer.

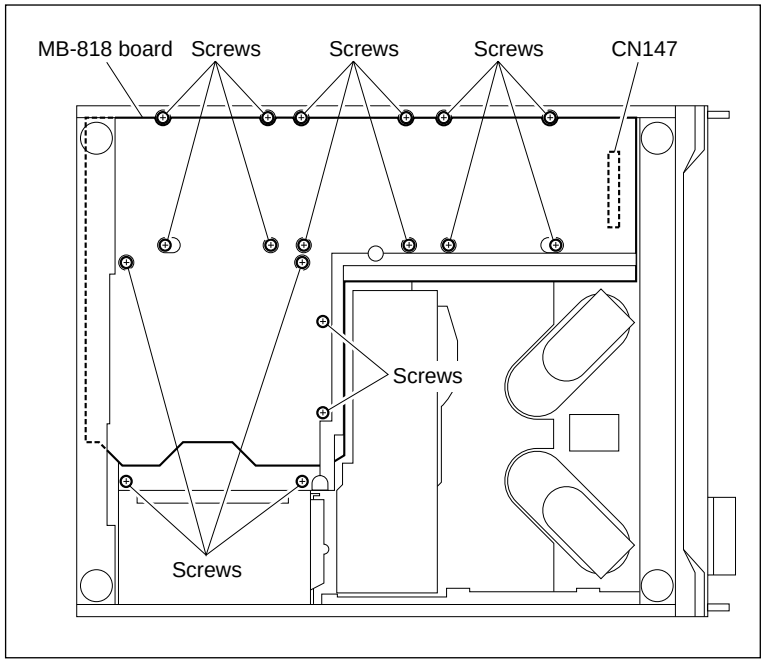


20. Disconnect the harnesses and flat cable from connectors CN140, CN144, CN154, and CN161.



21. Remove the eighteen screws and remove the MB-818 board.

22. Disconnect the flat cable from connector CN147 on the MB-818 board.



23. Install the MB-818 board in the reverse order of steps 2 through 22.
24. Turn the power on and confirm the unit runs in normal condition.

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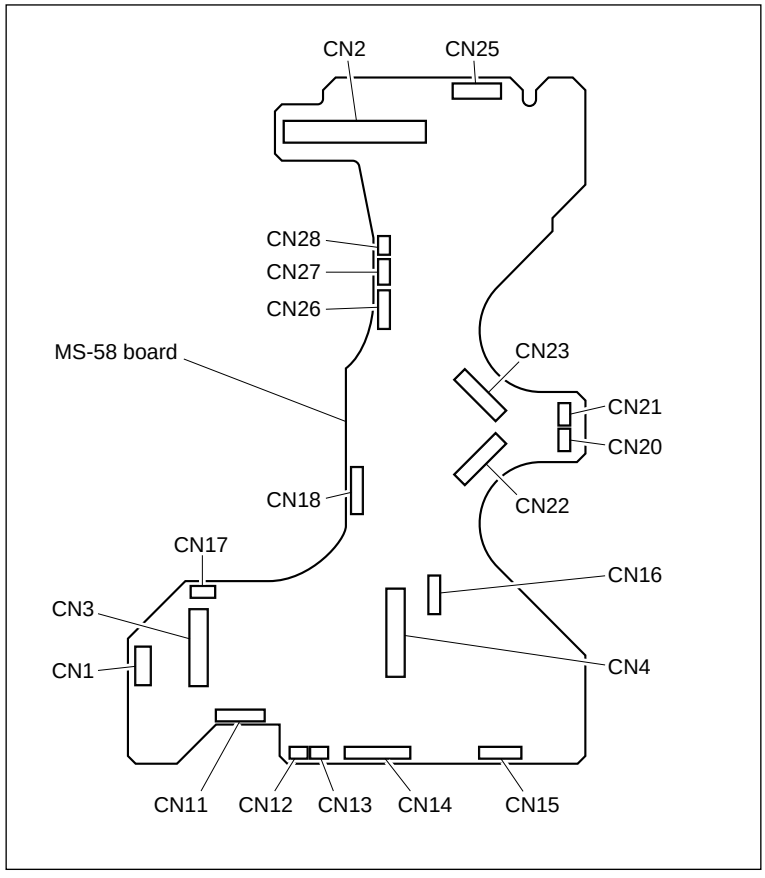
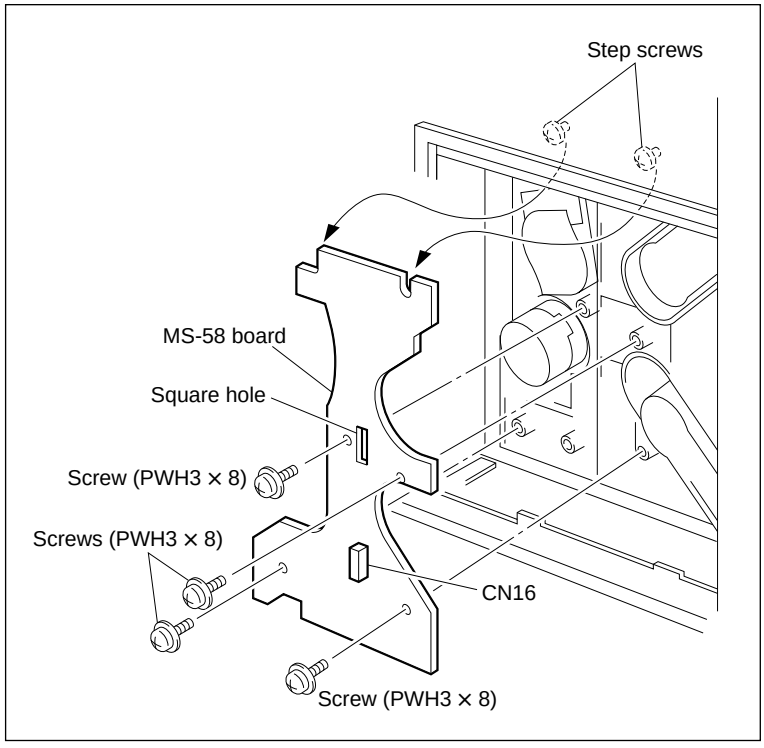
5-30-9. MS-58 Board

Replacement

1. Turn off the power.
2. Remove the DR-315 board.
   (Refer to Section 5-30-5.)
3. Disconnect the harnesses, flat cable or flexible card wires from the connectors CN1, CN2, CN3, CN4, CN11, CN12, CN13, CN14, CN15, CN16, CN17, CN18, CN20, CN21, CN22, CN23, CN25, CN26, CN27, and CN28 on MS-58 board.



4. Remove the four screws as shown in the figure.
5. Slide the MS-58 board toward the right side panel, and take off the upper side of MS-58 board from the two step screws.



6. Install the MS-58 board in the reverse order of steps 2 to 5.

Note

The MC sensor harness (connected to the connector CN16 on the MS-58 board) requires to thread in the square hole on the center portion of the MS-58 board.

Adjustment after Replacement

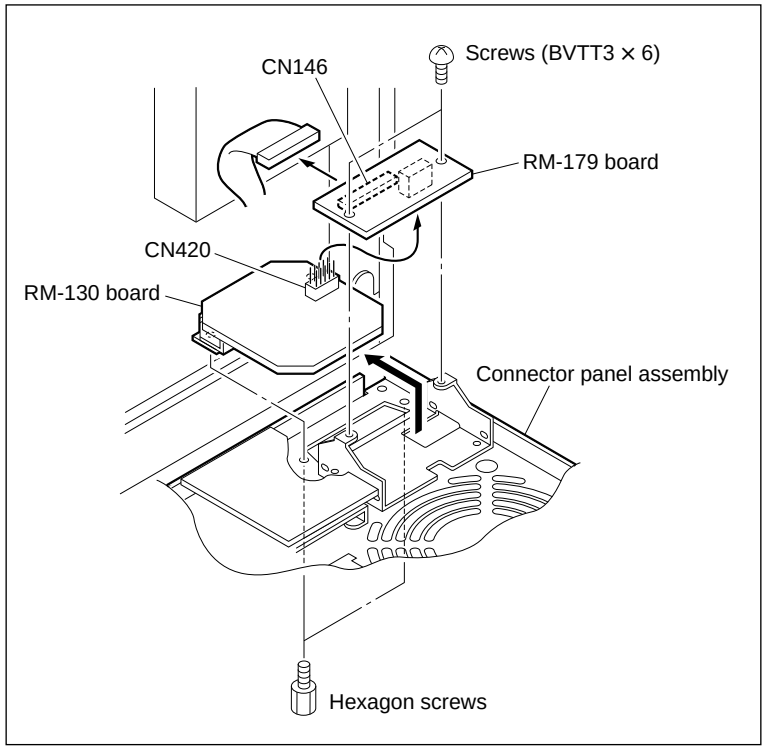
7. Perform the whole servo system electrical adjustment.
   (Refer to Section 4-4.)

5-30-10. RM-130/RM-179 Boards

Replacement

1. Turn off the power.
2. Remove the connector panel assembly. (Refer to Section 1-3-3.)
3. Disconnect the harness from connector CN146 on the RM-179 board.
4. Remove the two screws, and then remove the RM-179 board from connector CN420 on the RM-130 board.
5. Remove the two hexagon head screws, and then remove the RM-130 board in the direction indicated by the arrow.

6. Install the RM-130 and RM-179 boards in the reverse order of steps 2 through 5.



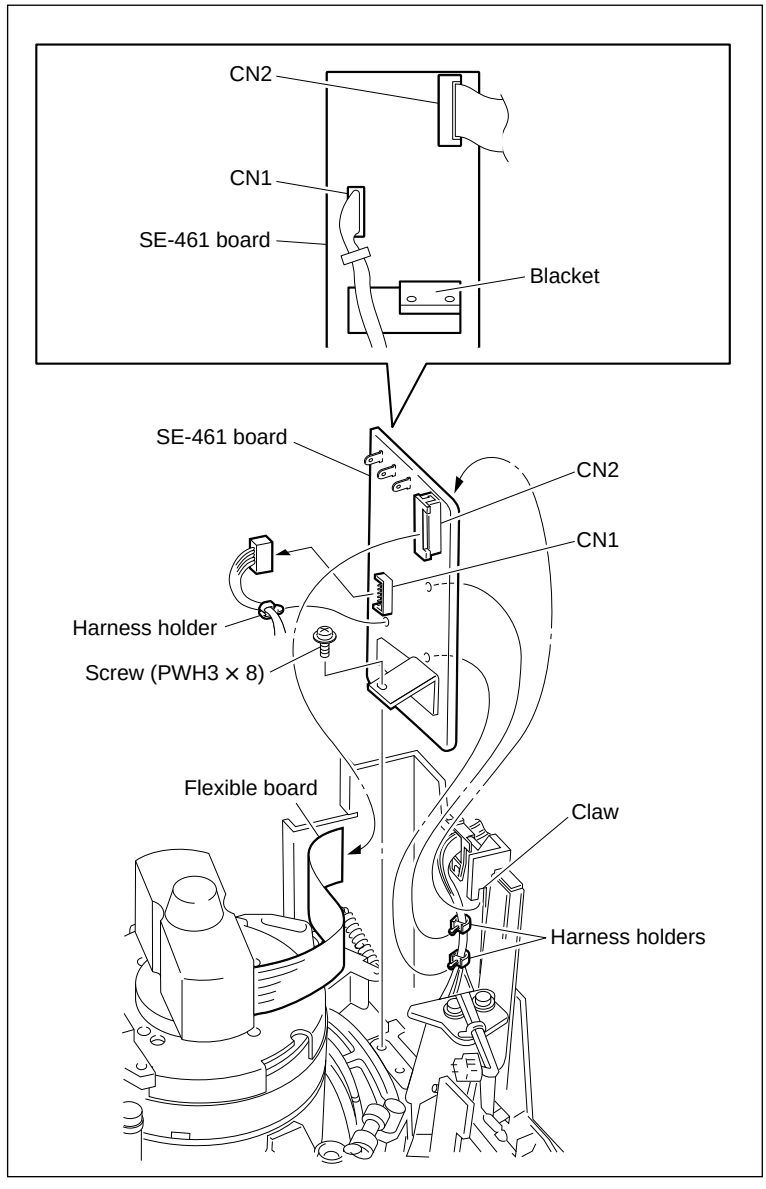
Adjustment after Replacement (RM-179 Board only)

7. Save the set data. (Refer to Section 1-25-26.)

5-30-11. SE-461 Board

Replacement

1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 1-3-1.)
3. Remove the plate MD assembly.
   (Refer to Section 1-4.)
4. Disconnect each harness and flexible board from the connectors (CN1 and CN2) on the SE-461 board.
5. Push out each fastening portion of the three harness holders shown in the figure using a pair of long-nose pliers or etc. from the board, then remove them.
6. Remove the screw and slide the SE-461 board to unlock from the claw, then remove the SE-461 board.



7. Install the SE-461 board in the reverse order of steps 2, 3, 4, 6, 5.

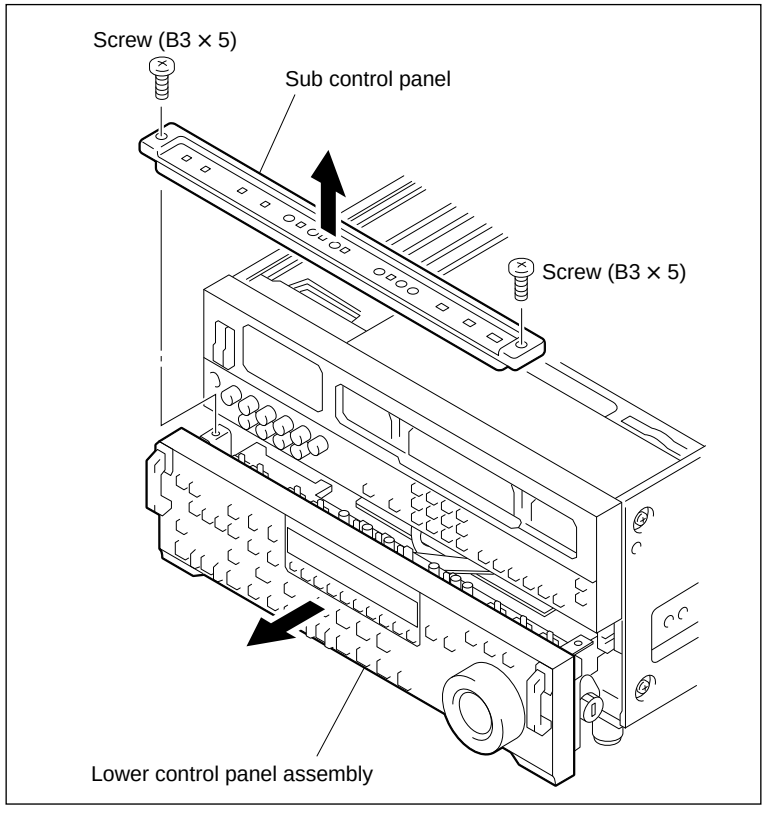
Confirmation after Replacement

8. Confirm that the dew sensor functions normally.
   Refer to Section 3-2-2.
   (C003: DEW SENSOR)

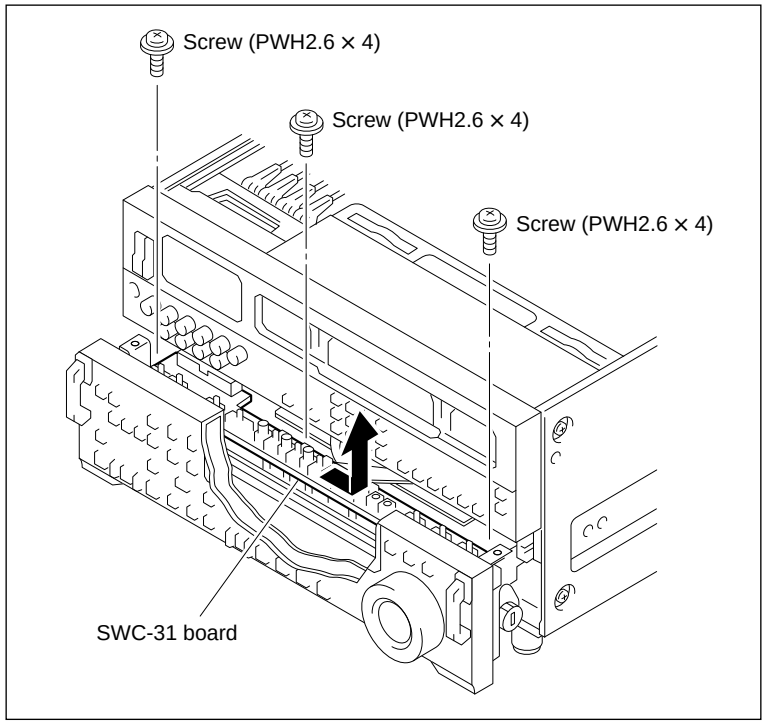
5-30-12. SWC-31 Board

Replacement

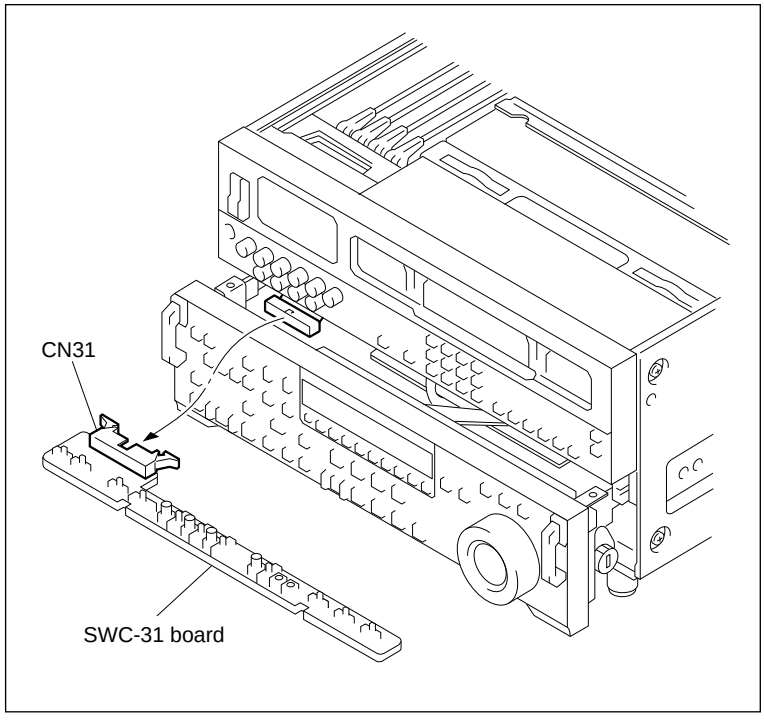
1. Turn off the power.
2. Pull out the lower control panel assembly.
3. Remove the two screws, then remove the sub control panel.



4. Remove the three screws.
5. Unlock the SWC-31 board by sliding it in the direction of the arrow, then remove the board.



6. Disconnect the flat cable from the connector CN31.
   Then remove the SWC-31 board.



7. Install the SWC-31 board in the reverse order of steps 2 through 6.

Note

Adjustment after replacement is not required.

Note

Perform the system phase adjustment of this unit again according to the maintenance manual of the analog switcher when this unit is used in combination with an analog switcher

.

System Phase Adjustment

The system phase of this unit is adjusted by using the SYNC control and SC control of SYSTEM PHASE on the sub control panel.

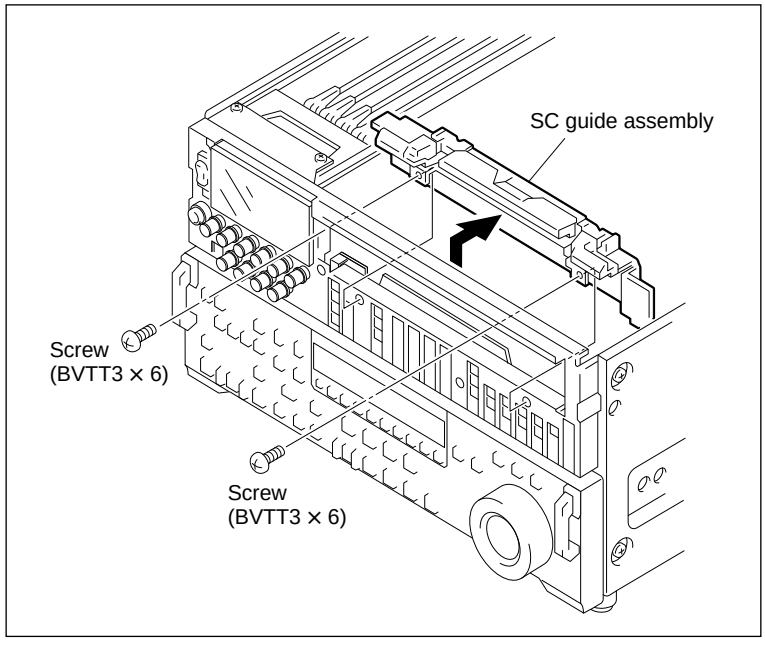
Notes

- Be sure to adjust in PB mode.
  The system phase does not change even if the SYNC/SC control is turned in the REC mode, but it changes when the REC mode is shifted to the PB mode.
- The playback sound may be momentarily in terrupted when the SYNC/SC control is turned during tape playback.

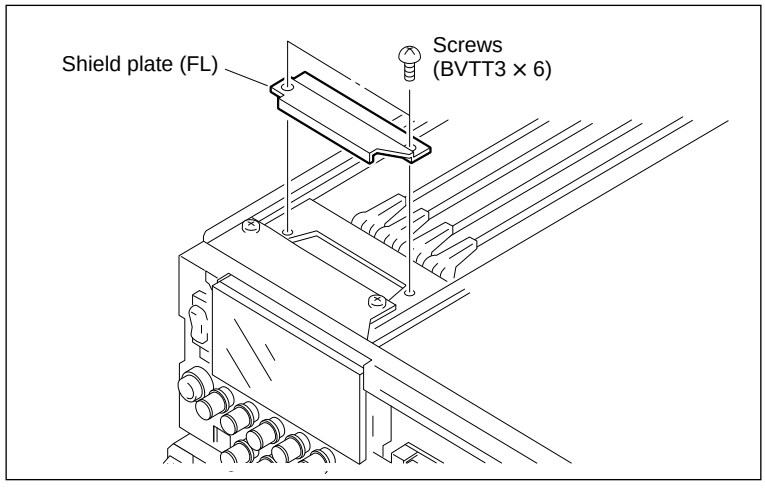
5-30-13. SWC-35 Board

Replacement

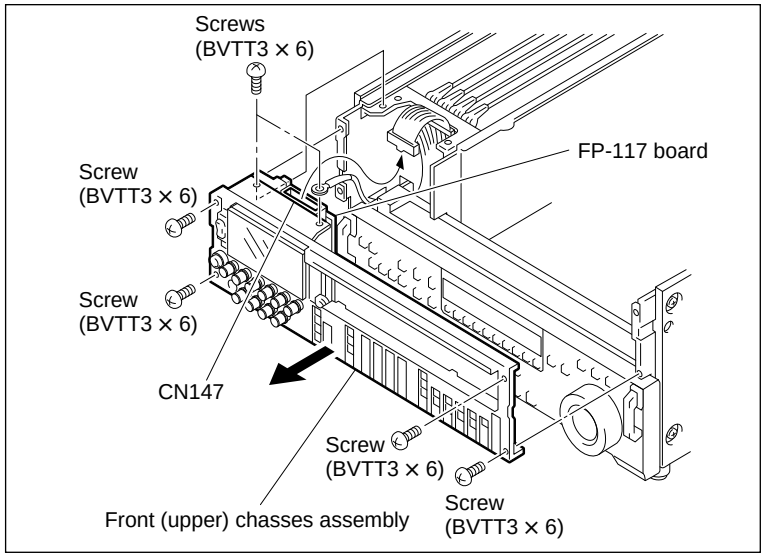
1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 1-3-1.)
3. Remove the plate MD assembly.
   (Refer to Section 1-4.)
4. Remove the cassette compartment assembly.
   (Refer to Section 1-5.)
5. Remove the upper control panel.
   (Refer to Section 1-3-2.)
6. Remove the two screws, then remove the SC guide assembly.



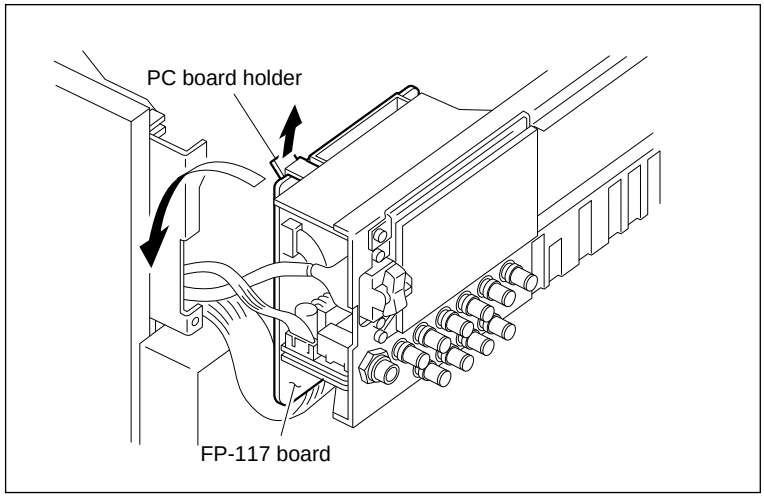
7. Remove the two screws, then remove the shield plate (FL).



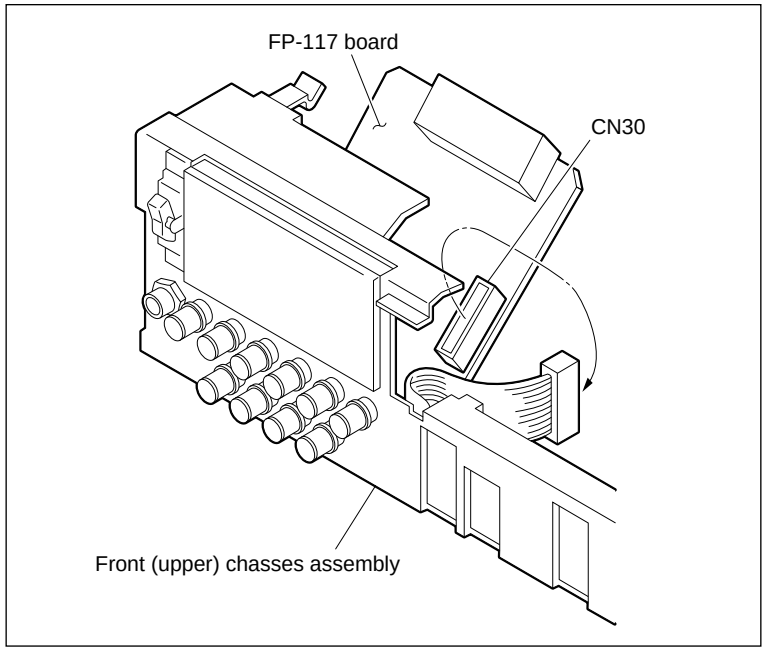
8. Disconnect the flat cable from the connector CN147 on the FP-117 board.
9. Remove the six screws, then pull out the front (upper) chassis assembly.



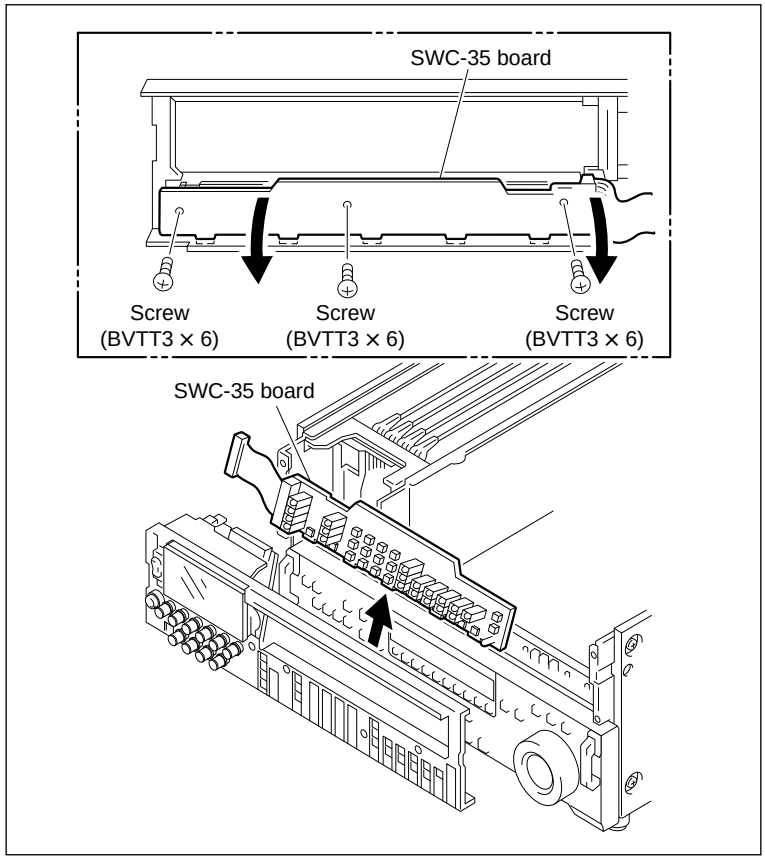
10. Undo the PC board holder, then open the FP-117 board.



11. Disconnect the flat cable from with the connector CN30 on the FP-117 board.



12. Remove the three screws, then remove the SWC-35 board by lift up the board after inclining to rear.



13. Install the SWC-35 board in the reverse order of steps 2 through 12.

Note

Adjustment after replacement is not required.

5-30-14. TC-102 Board

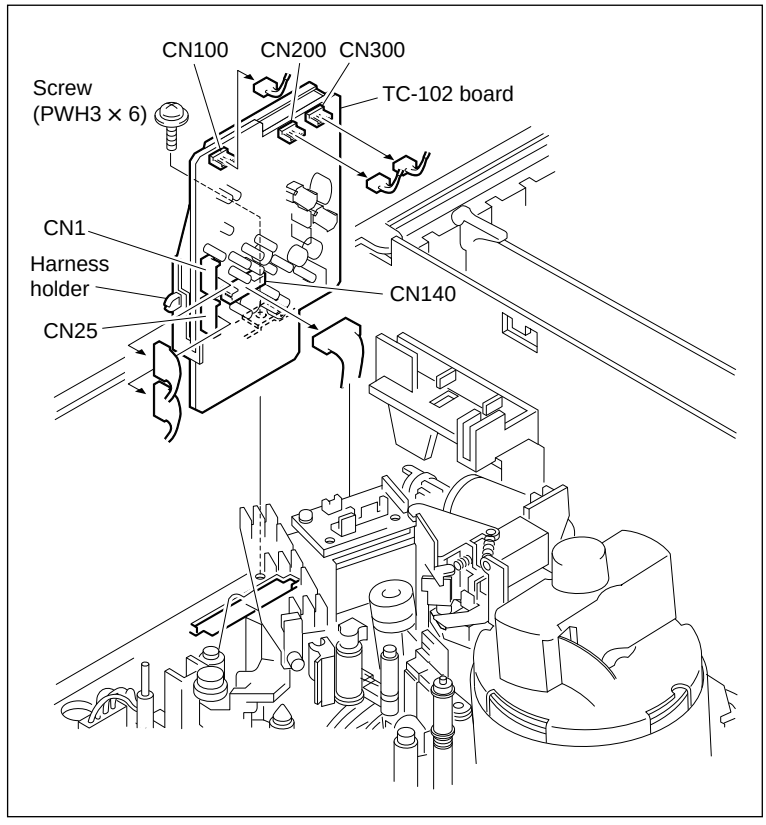
Replacement

1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 1-3-1.)
3. Remove the plate MD assembly.
   (Refer to Section 1-4.)
4. Remove the screw as shown in the figure.

   Note

   Pay attention not to fall the screw upon the mechanical deck.

5. Lifting the TC-102 board, and disconnect the harnesses from the connectors (CN100, CN200, CN300, CN1, CN25, and CN140) on the TC-102 board.
   Disconnect the CN1 harness from the harness holder.
   Then remove the TC-102 board.



6. Install the TC-102 board in the reverse order of steps 2 through 5.

Adjustment after Replacement

7. Perform the time code system adjustment or confirmation.
   (Refer to Section 4-11.)

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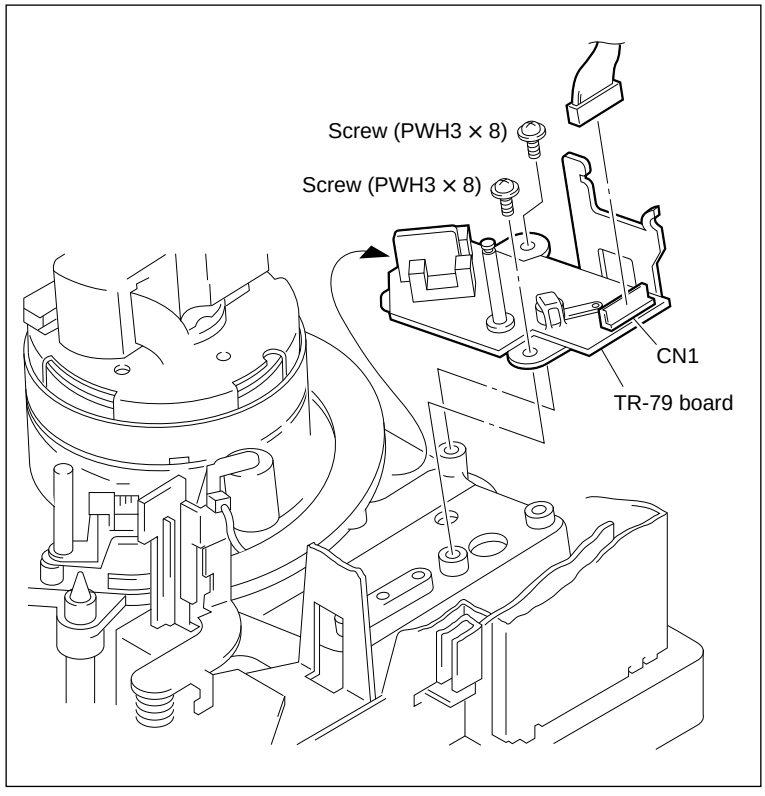
5-30-15. TR-79 Board

Replacement

1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 1-3-1.)
3. Remove the plate MD assembly.
   (Refer to Section 1-4.)
4. Remove the T tension arm assembly.
   (Refer to Section 5-24.)
5. Disconnect the harness from the connector CN1 on the TR-79 board.
6. Remove the two screws, then remove the TR-79 board.



7. Install the TR-79 board in the reverse order of steps 2 through 6.

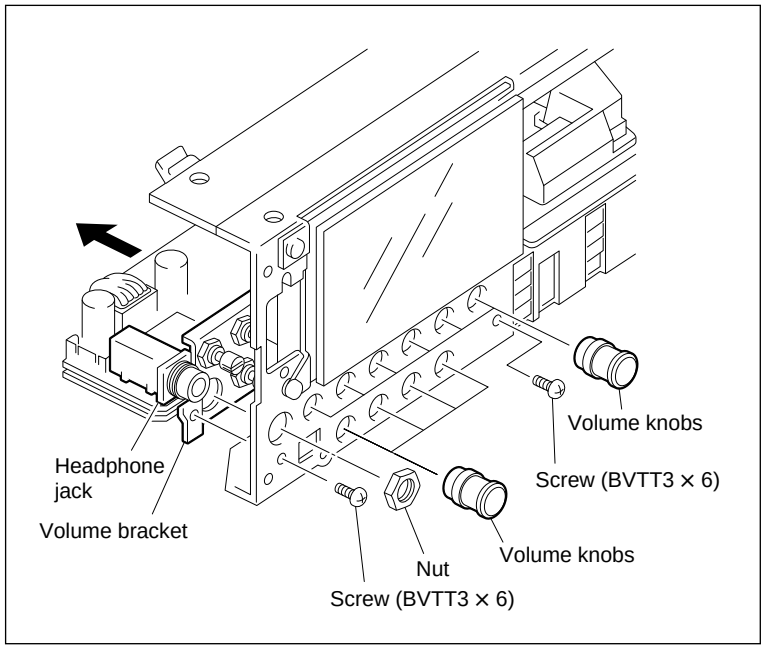
Adjustment after replacement

8. Perform the tension offset adjustment.
   Refer to Section 3-2-5.
   (A008: S/T TENSION OFFSET)
9. Perform the adjusted data save.
   Refer to Section 3-2-5.
   (A012: NV-RAM CONTROL)

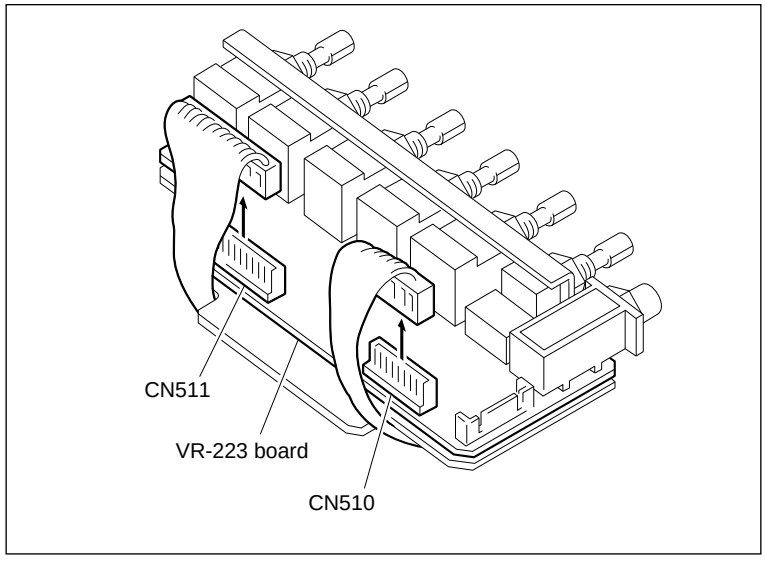
5-30-16. VR-223 Board

Replacement

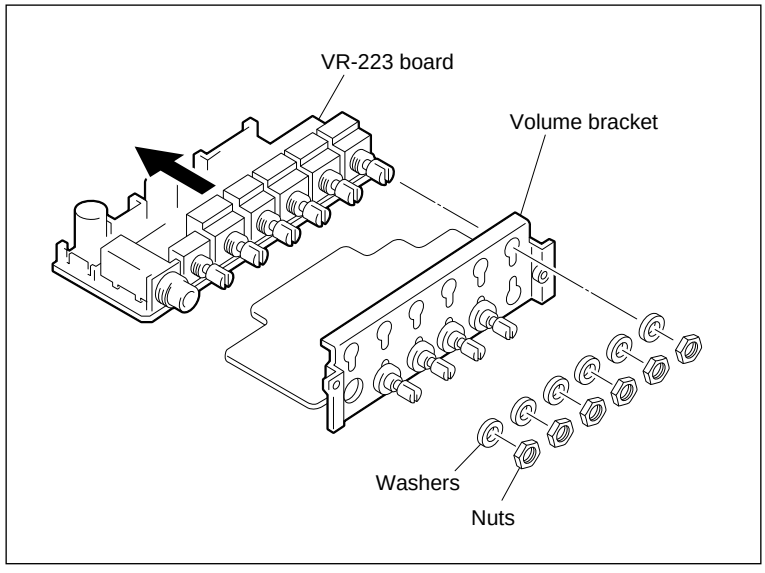
1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 1-3-1.)
3. Remove the plate MD assembly.
   (Refer to Section 1-4.)
4. Remove the cassette compartment assembly.
   (Refer to Section 1-5.)
5. Remove the upper control panel.
   (Refer to Section 1-3-2.)
6. Remove the FP-117 board.
   (Refer to Section 5-30-6.)
7. Remove the ten volume knobs.
8. Remove the nut of the headphone jack.
9. Remove the two screws, and remove the volume bracket.



10. Disconnect the hernesses from the connectors (CN510 and CN511).



11. Remove the six nuts and washers, and remove the VR-223 board.



12. Install the VR-223 board in the reverse order of steps 2 through 11.

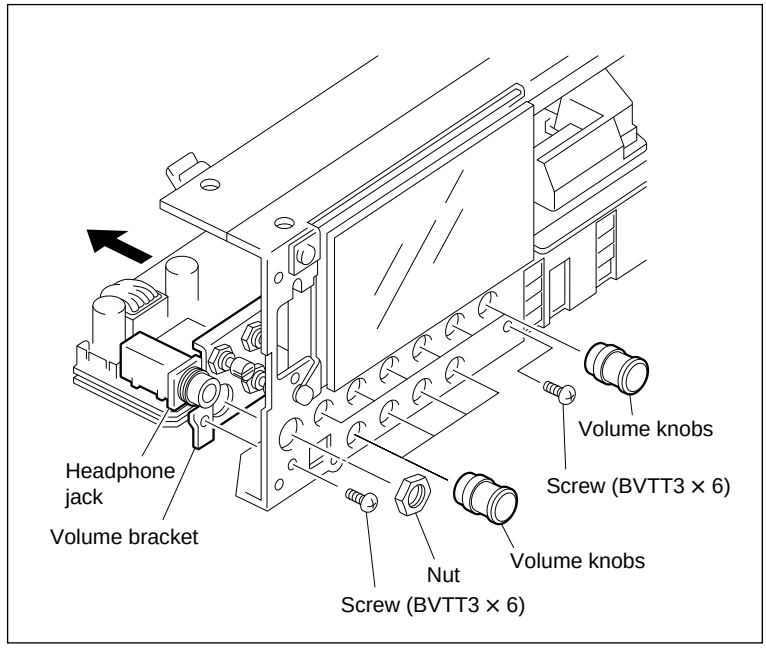
Notes

- After tightening the nuts, apply the locking compound.
- Adjustment after replacement is not required.

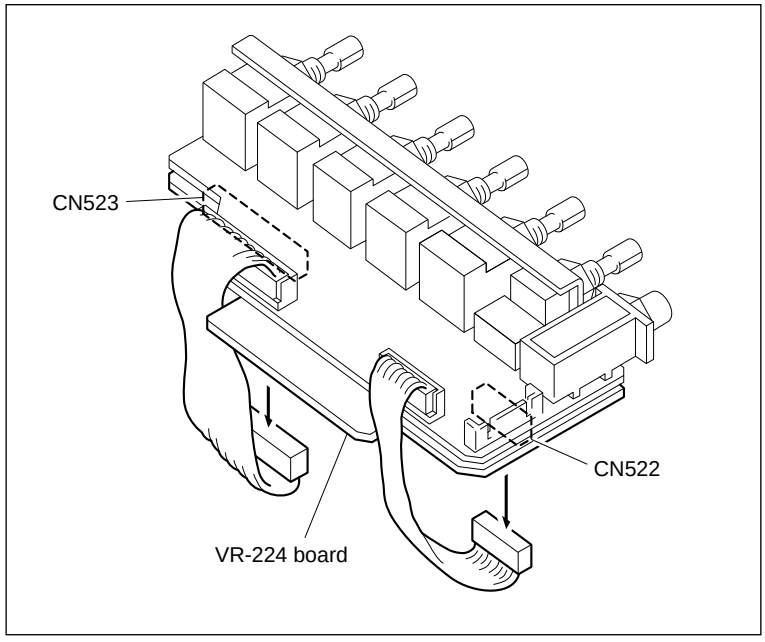
5-30-17. VR-224 Board

Replacement

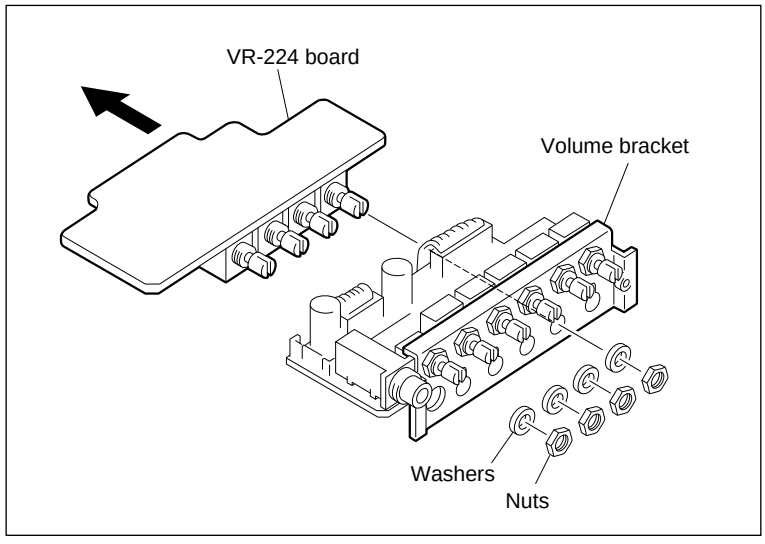
1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 1-3-1.)
3. Remove the plate MD assembly.
   (Refer to Section 1-4.)
4. Remove the cassette compartment assembly.
   (Refer to Section 1-5.)
5. Remove the upper control panel.
   (Refer to Section 1-3-2.)
6. Remove the FP-117 board.
   (Refer to Section 5-30-6.)
7. Remove the ten volume knobs.
8. Remove the nut of the headphone jack.
9. Remove the two screws, and remove the volume bracket.



10. Disconnect the harnesses from the connectors (CN522 and CN523).



11. Remove the four nuts and washers, and remove the VR-224 board.



12. Install the VR-224 board in the reverse order of steps 2 through 11.

Notes

- After tightening the nuts, apply the locking compound.
- Adjustment after replacement is not required.

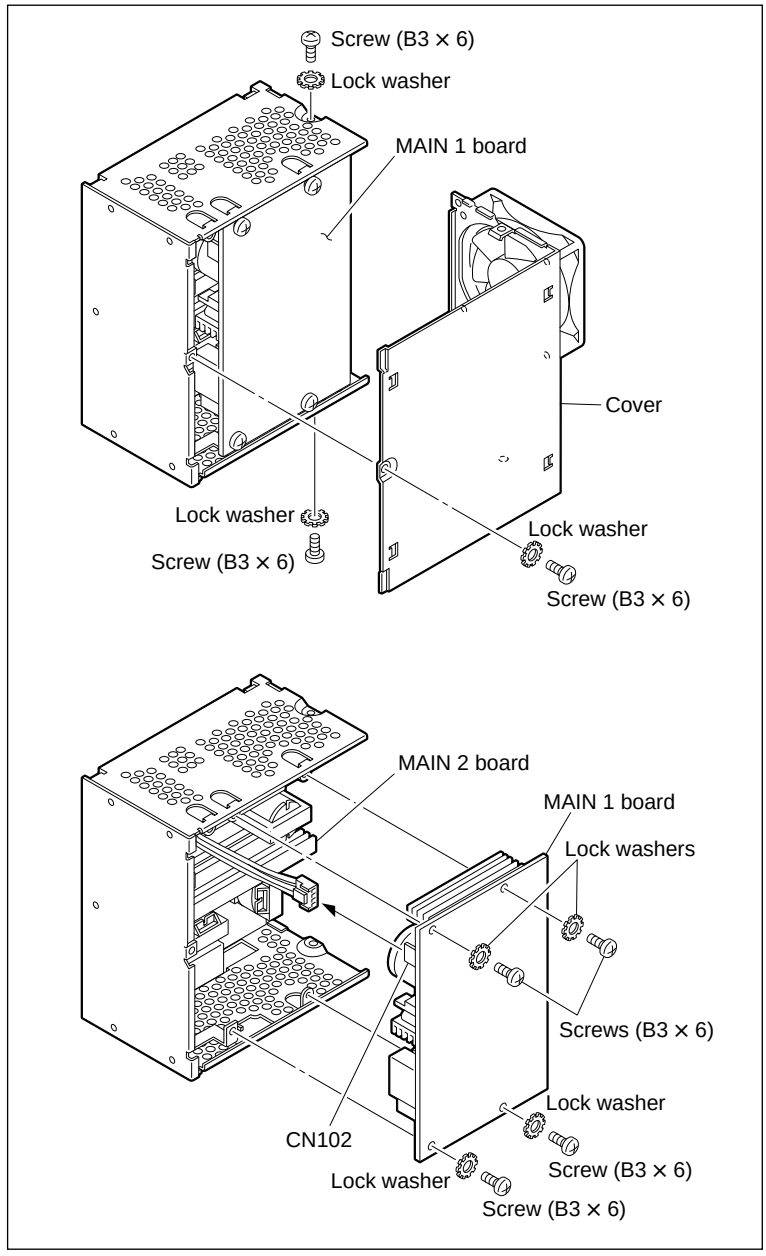
5-31. Board Replacement in Power Supply Unit

Note

Replace the whole power supply unit when replacing the MAIN 2 board.

Replacement of MAIN 1 Board

1. Turn off the power and wait for more than 30 seconds.
2. Remove the power supply unit. (Refer to Section 5-29.)
3. Remove the three screws and lock washers, and then remove the cover.
4. Remove the four screws and lock washers.
5. Disconnect the harness from connector CN102 and remove the MAIN 1 board.



6. Install the MAIN 1 board in the reverse order of steps 2 to 5.

Adjustment after Replacement

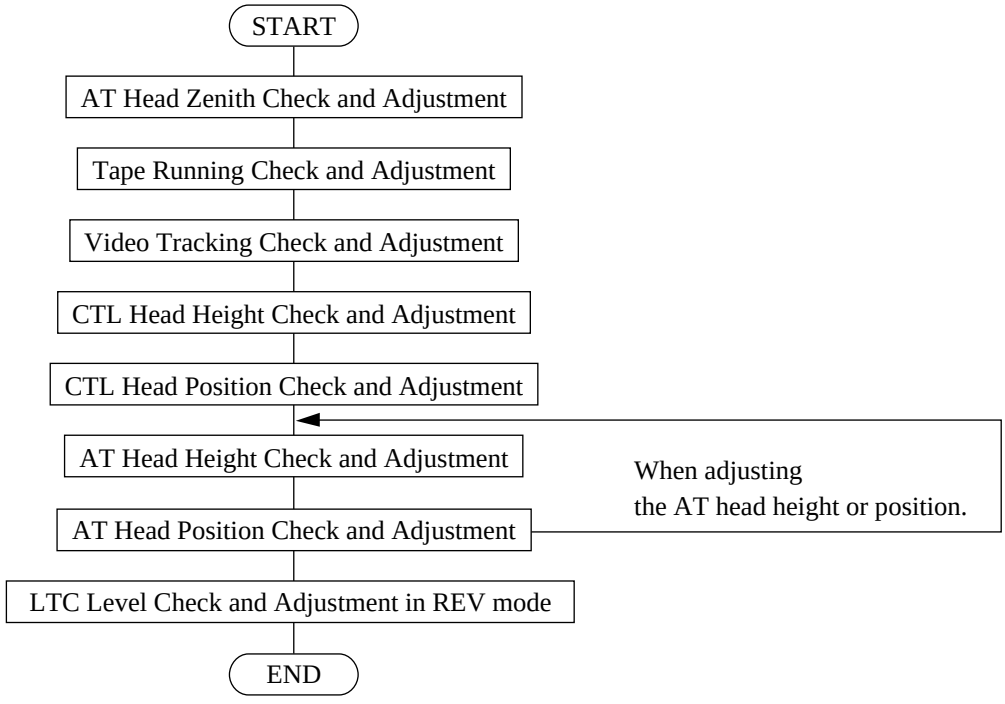
7. Perform the output voltage adjustment. (Refer to Section 4-2-2.)

Section 6
Tape Path Alignment

6-1. Tape Path Adjustment

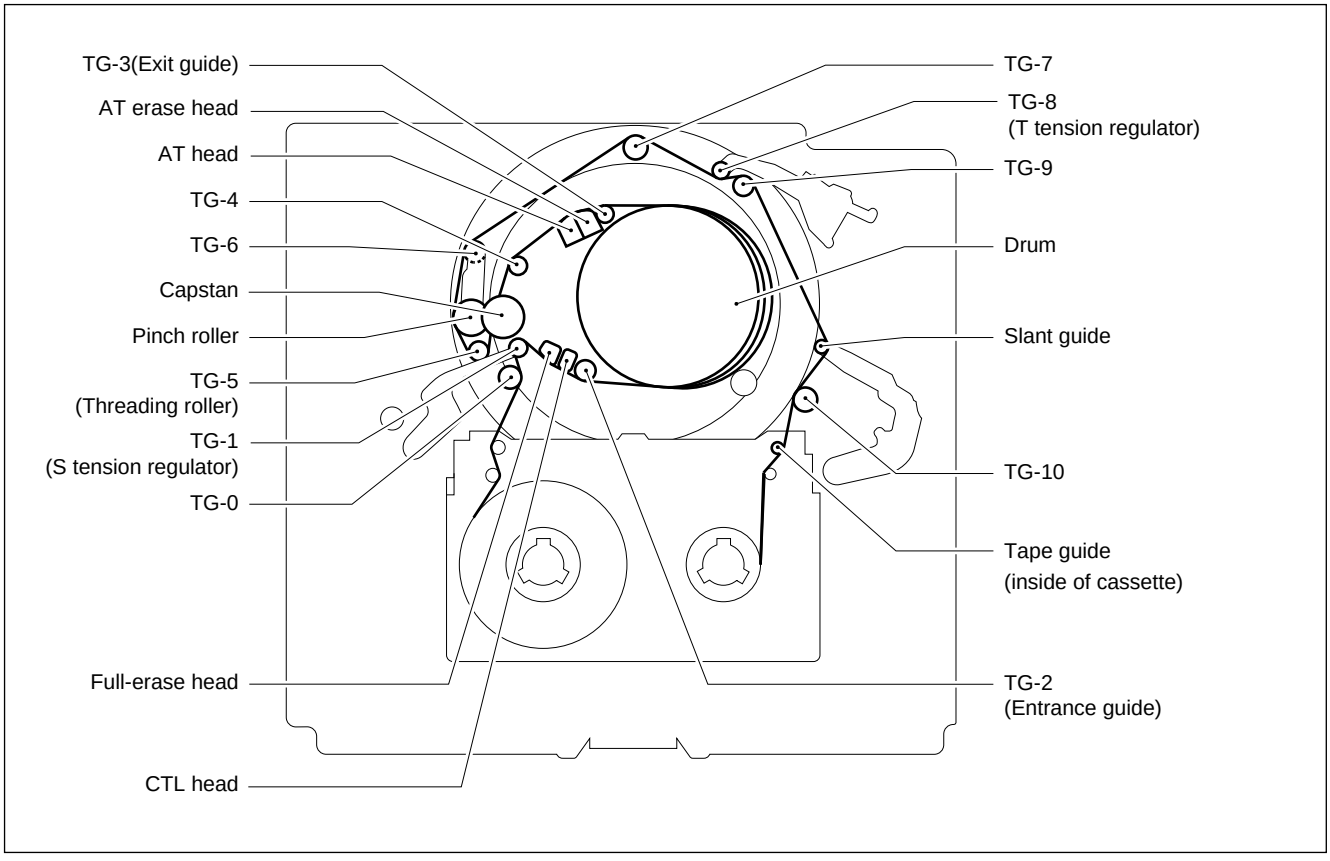
This section describes the checking and adjusting methods of the tape path system such as position, height, and slantness of tape guides and stationary heads.

1. Tape Path Adjustment Flow Chart


START
AT Head Zenith Check and Adjustment
Tape Running Check and Adjustment
Video Tracking Check and Adjustment
CTL Head Height Check and Adjustment
CTL Head Position Check and Adjustment
AT Head Height Check and Adjustment
AT Head Position Check and Adjustment
When adjusting
the AT head height or position.
LTC Level Check and Adjustment in REV mode
END

2. Parts Location of the Tape-running System

Following figure describes the names of each part of the tape-running system.
It is illustrated in the threading end mode. “ TG ” in the figure means the tape guide.



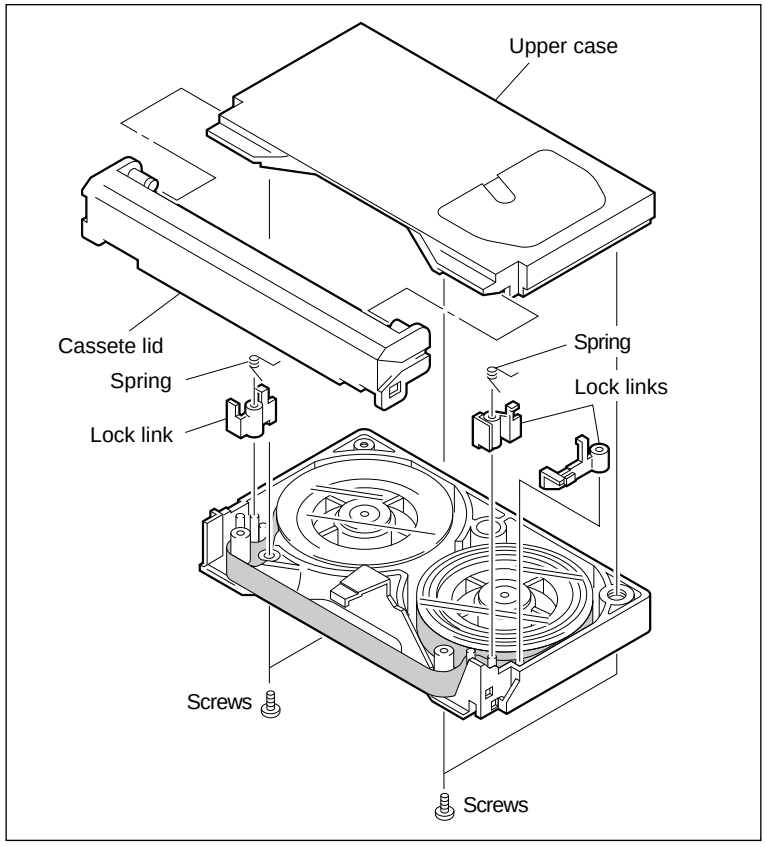
3. Cassette Compartment

- The tape path adjustment should be performed under the state that the cassette compertment is removed. If not, some checks and adjustments may be impossible.
- When the tape path adjustment is performed with the cassette compartment removed, the tape protection circuit is activated and the “ERROR” message may be displayed. In this case, turn the power off, then turn it on again.

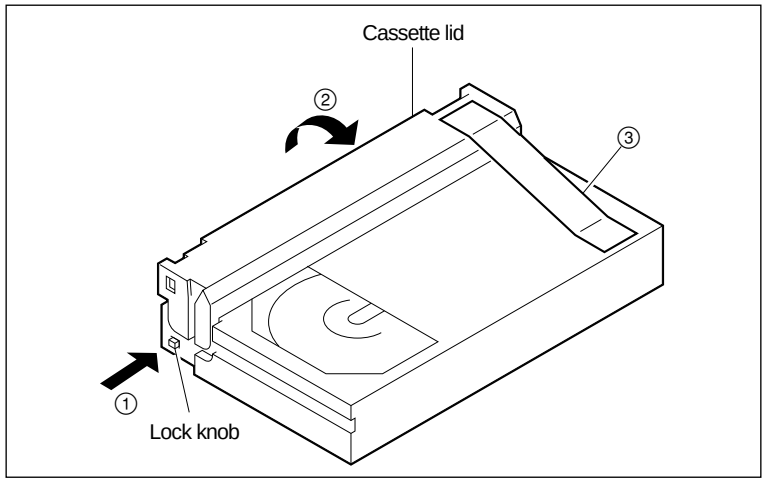
4. Cassette Tape

The tape path adjustment is performed after the cassette compertment removal.
Then, it is necessary to make a modification to the cassette tape and alignment tape that are used for tape path adjustment as follows.

(1) Cassette tape without lid
Disassembly the cassette tape, and take off the cassette lid, lock links and springs shown in the figure.



(2) Cassette tape with holding lid
Open the cassette lid (②) while pushing the lock knob (①) and fix the cassette lid using an adhesive tape (③).



When setting the cassette tape or the alignment tape on the VTR, put it to the cassette supports on the mechanical deck. And then, put a weight on the cassette so that it does not rise up. The weight about 1000 g is suitable.

5. Tracking Control

The method of the tracking control in the playing back mode is described below.
(1) Set a cassette tape and put a weight on the cassette so that it does not rise up. Weight about 1000 g is suitable.
(2) Press the PLAY button, then the tape is played back.
(3) Push S100 switch on the SS-83 board more than 1 sec..
In this state, RV100 variable resistor on the SS-83 board becomes the tracking control volume (and the LED D112 lights).
When the EJECT button is pressed or S100 switch on the SS-83 board is pushed more than 1 sec. after adjustment, the tracking control is fixed.

6. Preparation

(1) Remove the cassette compartment.
(Refer to Section 1-5.)
(2) Remove the video head cleaner.
(Refer to Section 5-5.)

Note

If the video head cleaner is attached, the tape-running condition may be difficult to check. Therefore, remove the video head cleaner assembly before checking.

(3) Clean the following portions :
- Tape-running surfaces of upper drum and heads
(Refer to Section 2-2-3.)
- Lower drum's tape running surface and lead surface
(Refer to Section 2-2-4.)
- Stationary heads
(Refer to Section 2-2-5.)
- Tape-running system and tape cleaner
(Refer to Section 2-2-6.)

7. Alignment Tape

(1) SR2-1 (For 525/60 system) : 8-960-075-11
SR2-1P (For 625/50 system) : 8-960-075-61

• Contents:

Time min. sec.	CTL track	AUX track	Video/Audio track	Use
00 : 00 ⇧ (PULSE) ⇩ 15 : 00	CTL	3 kHz, 0 VU (SR2-1) 3.15 kHz, 0 VU (SR2-1P)	3.212 MHz (A CH only)	• Video Tracking Adjustment • CTL Head Position Adjustment • AT Head Height Adjustment • AT Head Position Adjustment
15 : 00 – 20 : 00	CTL	3 kHz, 0 VU (SR2-1) 3.15 kHz, 0 VU (SR2-1P)	A CH: 3.212 MHz B CH: 6.424 MHz	
20 : 00 – 25 : 00	CTL	3 kHz, 0 VU (SR2-1) 3.15 kHz, 0 VU (SR2-1P)	12.848 MHz (ALL CH)	
25 : 00 – 27 : 00	CTL	————	100 % Color Bars	• Drum PG Phase Automatic Adjustment

* CTL head height adjustment can be performed at any portion of this alignment tape.
* When the pulse portion (00:00 to 15:00) is played back, the displayed TC data is interpolated by CTL signal due to no recording on the time code track.

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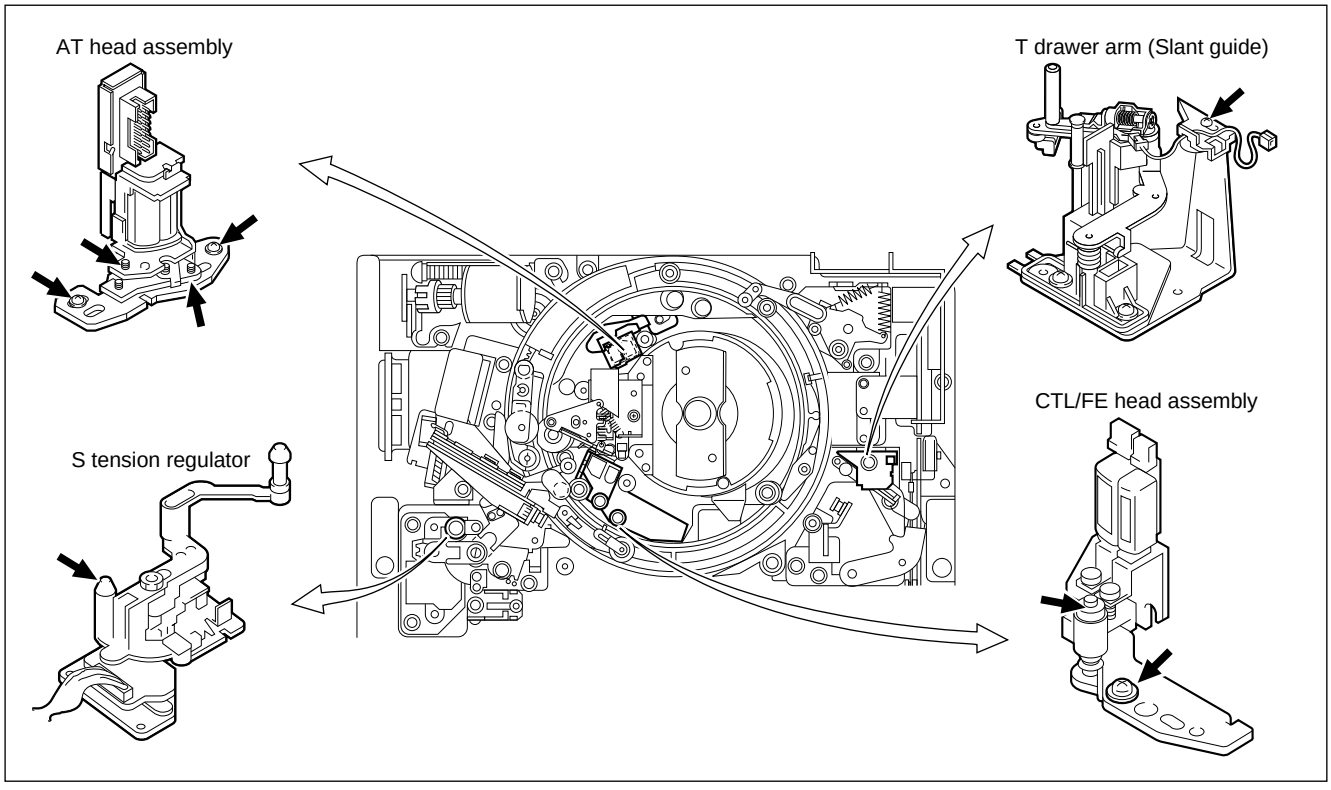
8. Locking Compound

When loosening the following screws, apply the locking compound to the screws after adjustment is completed.
The locking compound that applied to other surrounding parts must be wiped off using gauze or soft cloth.

• Locking compound : 7-432-114-11



6-1-1. AT Head Zenith Check and Adjustment

Note

The AT head zenith check and adjustment are required only when the AT head is replaced.

Tools

- Flatness plate (SL-657): J-6086-570-A
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Check

1. Unthreading End Mode

Check that the unit is in the unthreading end mode.

2. Check the AT Head Zenith

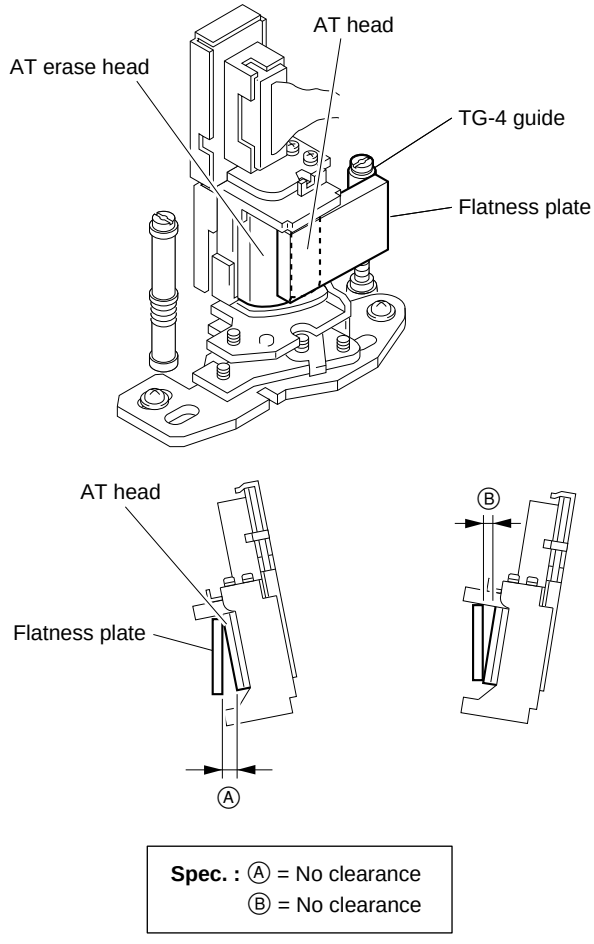
(1) Lightly place the flatness plate against the TG-4 guide and AT head.

Note

Be careful not to damage the surface of the AT head and TG-4 guide.

(2) Check that no clearance exists between the AT head and flatness plate as TG-4 guide reference in step (1).

If the specification is satisfied, perform step 7.
If not, perform steps 3 and later.



AT Head Zenith Check

Adjustment

3. Remove the CL Guide Rail

Remove the two screws, then remove the CL guide rail.

4. In Case of Clearance Exists at the Upper Part (Fig. 1)

Turn the zenith adjustment screw counterclockwise to satisfy the specification.

5. In Case of Clearance Exists at the Lower Part (Fig. 2)

Turn the zenith adjustment screw clockwise to satisfy the specification.

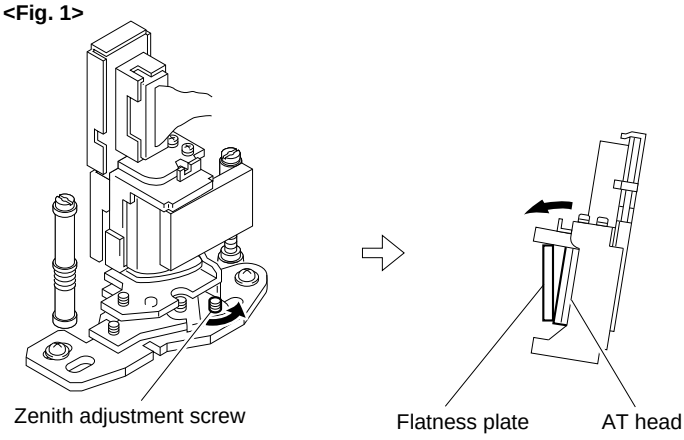
6. Attach the CL Guide Rail

Attach the CL guide rail with two screws.

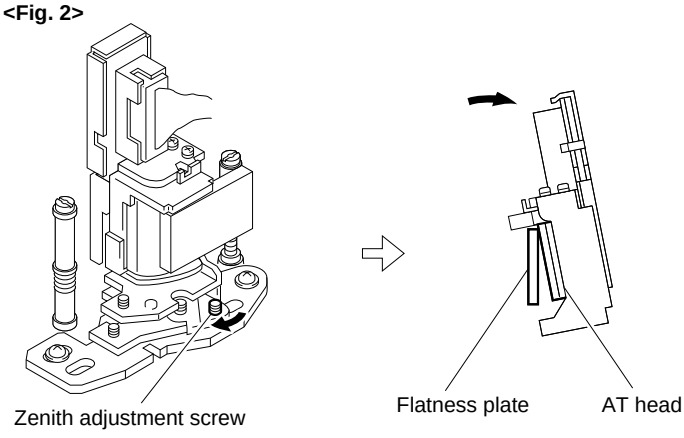
7. Cleaning

Clean each surface of the AT head, AT erase head, and TG-4 guide using a cleaning cloth moistened with cleaning fluid.

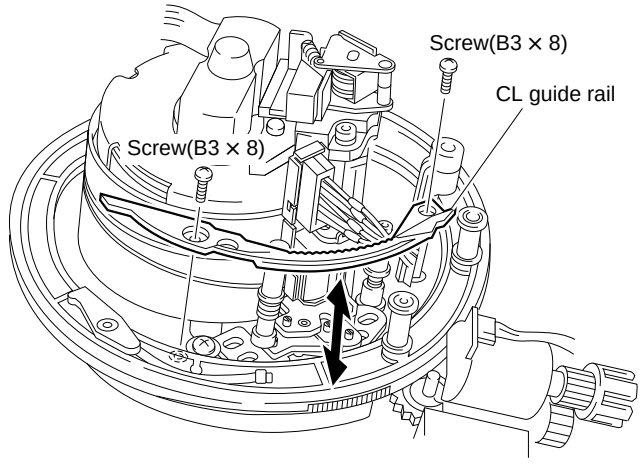
<Fig. 1>



<Fig. 2>



・Removing/Attaching the CL Guide Rail



AT Head Zenith Adjustment

6-1-2. Tape Running Check and Adjustment

Note

The tape-running is closely related to the height of the S and T reel tables. Check the height of the S and T reel tables before this tape-running check and adjustment. (Refer to Section 5-15-4.)

Tape Entrance Side

Tools

- Betacam cassette (S cassette): BCT-30MA
- Adjustment mirror (circular): J-6080-029-A
- Tape guide adjustment driver (MW-261): J-6322-610-A

Check

1. Set the S Cassette Tape

(1) Place the reel tables in the S cassette position. (Refer to Section 5-1-3.)
(2) Set the S cassette and put a weight on the cassette so that it does not rise up. Weight about 1000 g is suitable.

2. Turn the Power On

3. PLAY Mode

Check that the tape-running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.

4. REV × 10 Mode

Check that the tape-running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.

5. F. FWD Mode

Check that the tape-running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.

6. REW Mode

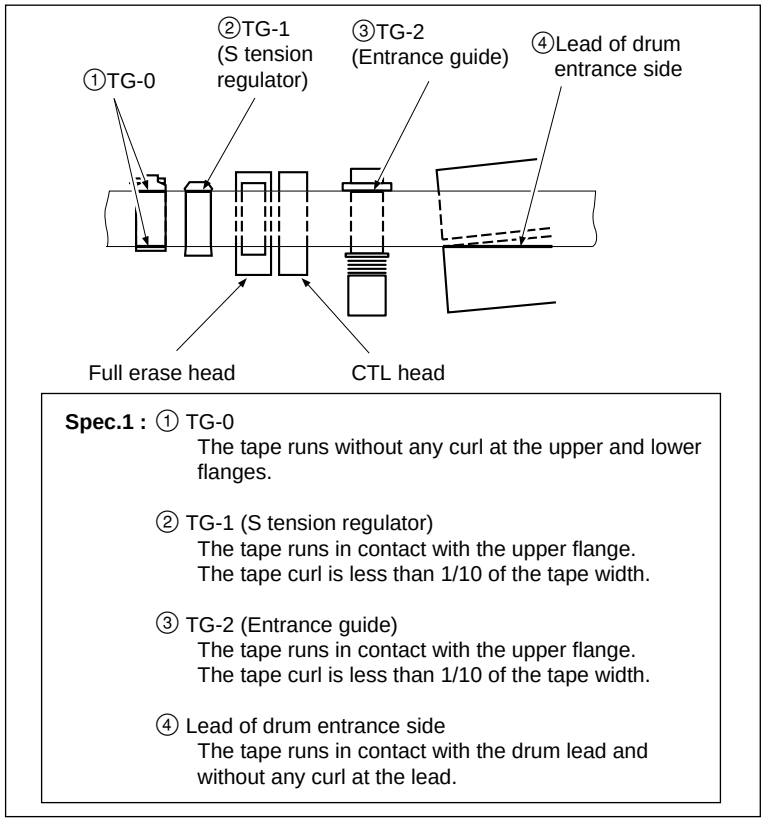
Check that the tape-running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.

7. REV × 1 Mode

Check that the tape-running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.

8. VAR × –1/30 Mode

Check that the tape-running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.


①TG-0
②TG-1 (S tension regulator)
③TG-2 (Entrance guide)
④Lead of drum entrance side
Full erase head
CTL head
Spec.1 : ① TG-0
The tape runs without any curl at the upper and lower flanges.
② TG-1 (S tension regulator)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.
③ TG-2 (Entrance guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.
④ Lead of drum entrance side
The tape runs in contact with the drum lead and without any curl at the lead.

Tape-running Check at Tape Entrance Side

Adjustment

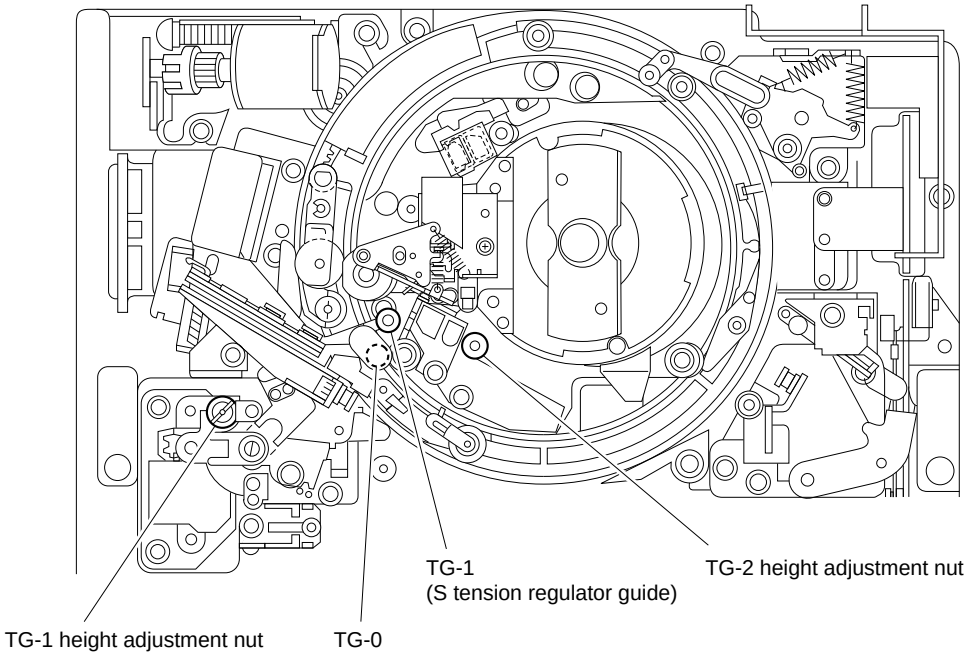
9. Adjust the TG-1 and TG-2 Height

(1) Put the unit into the PLAY mode.
(2) Turn the height adjustment nuts of TG-1 and TG-2 using a tape guide adjustment driver and adjust the height of TG-1 and TG-2 so that the specification 1 is satisfied.

10. Recheck the Tape-running at Tape Entrance Side

Perform the tape-running check refer to steps 3 through 8, and perform the video tracking adjustment (Refer to Section 6-1-3).

If the specification 1 is not satisfied, perform the adjustment in step 9 again.



Tape-running Adjustment at Tape Entrance Side

Tape Exit Side

Tools

- Betacam cassette (S cassette): BCT-30MA
- Betacam cassette (L cassette) : BCT-90MLA
- Adjustment mirror (circular): J-6080-029-A
- Tape guide adjustment driver (MW-261): J-6322-610-A

Check

1. Set the S Cassette Tape

(1) Set the reel tables to the S cassette position. (Refer to Section 5-1-3.)
(2) Set the S cassette and put a weight on the cassette so that it does not rise up. Weight about 1000 g is suitable.

2. Turn the Power On

3. PLAY Mode

Check that the tape-running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 12 and 14.

4. REV × 10 Mode

Check that the tape-running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 13 and 14.

5 F. FWD Mode

Check that the tape-running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 12 and 14.

6. REW Mode

Check that the tape-running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 12 and 14.

7. REV × 1 Mode

Check that the tape-running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 12 and 14.

8. VAR × –1/30 Mode

Check that the tape-running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 13 and 14.

9. Set the L Cassette Tape

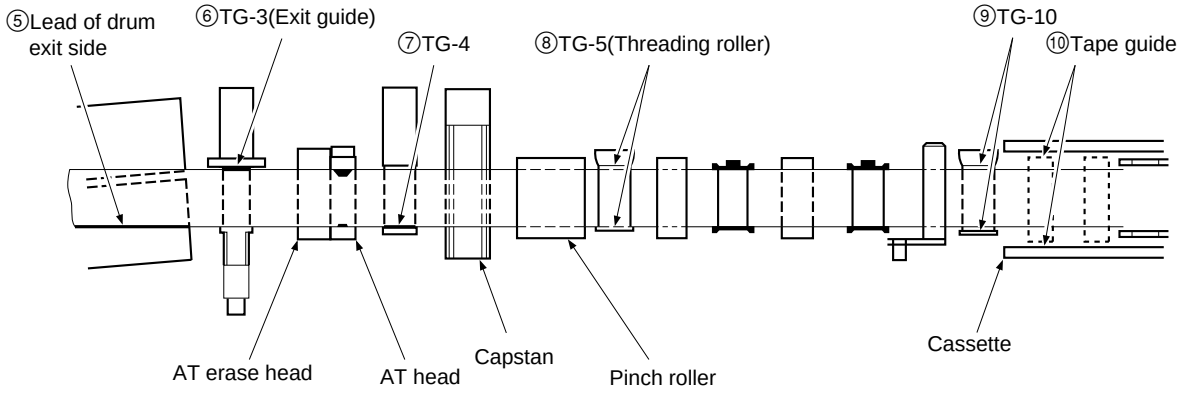
(1) Remove the S cassette.
(2) By pressing S100 switch (D-1/side A) on the SS-83 board, set the reel tables to the L cassette position.
(3) Set the L cassette and put a weight on the cassette so that it does not rise up. Weight about 1000 g is suitable.

10. Play Back the Tape

Play back the tape beginning portion of the L cassette.

11. Check the Tape-running at the T Tape Guide of Cassette and TG-10.

Check that the tape-running condition satisfies specification 3 at TG-10 and the T tape guide of the L cassette.
If specification 3 is not satisfied, perform step 15.



Spec.2 : ⑤ Lead of drum exit side
The tape runs in contact with the drum lead and without any curl at the lead.

⑥ TG-3(Exit guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

⑦ TG-4
The tape runs in contact with the lower flange.
The tape curl is less than 1/10 of the tape width.

⑧ TG-5(Threading roller)
The tape runs without any curl at the upper and lower flanges.

Spec.3 : Play mode
⑨ TG-10
The tape runs not in contact with the upper and lower flanges.

⑩ Take-up side tape guide of cassette
The tape runs without any curl at the upper and lower portions of the tape guide.

Tape-running Check at Tape Exit Side

Adjustment

12. Adjust the TG-3 (Exit Guide) and TG-4 Height

(1) Set the S cassette and put the unit into the PLAY mode.
(2) Turn the height adjustment nuts of TG-3 and TG-4 using a tape guide adjustment driver and adjust the height of TG-3 and TG-4 so that the specification 2 is satisfied.
(3) Perform the video tracking adjustment (Refer to Section 6-1-3).

13. Adjust the TG-5 (Threading Roller) Height (only when the specification is not satisfied in REV × 10 mode and VAR × –1/30 mode)

(1) Press the EJECT button.
(2) Remove the cassette tape.
(3) Turn the upper flange of TG-5 using a tape guide adjustment driver and adjust the height of TG-5 so that the specification 2 is satisfied.
(4) Set the S cassette tape and put the unit into the REV × 10 mode or VAR × −1/30 mode. At this time, check that the tape-running condition satisfies specification 2.

    If it is not satisfied, repeat steps (1) through (4) mentioned above.

14. Recheck the Tape-running at Tape Exit Side

Perform steps 2 through 8 again.

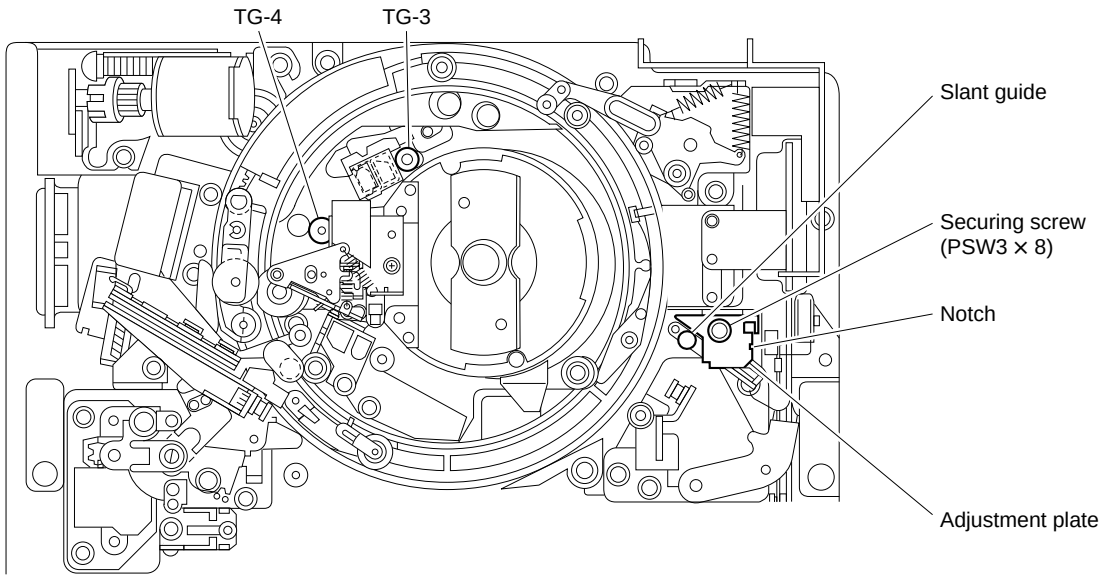
If the specification 2 is not satisfied, perform the adjustment in step 12 again.
(If the specification 2 is not satisfied in REV × 10 mode or VAR ×−1/30 mode, perform the adjustment in step 13 again.)

15. Adjust the Slant Guide Slantness

(1) Loosen the fixing screw of the adjustment plate by 1/4 to 1/2 turn.
(2) Insert a 3 mm flatbladed screwdriver into the notch of the adjustment plate.
(3) Turn the screwdriver to adjust the slantness of the slant guide so that specification 3 is satisfied.
(4) Tighten the screw loosened in step (1).
(5) Recheck that specification 3 is satisfied referring to steps 9 through 11.

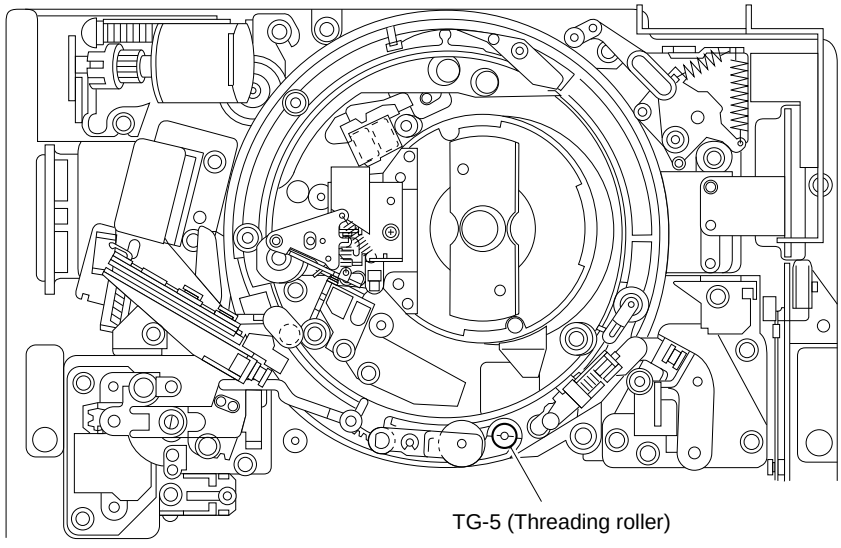
    If it is not satisfied, repeat steps (1) through (5) mentioned above.

・TG-3 and TG-4 height adjustment/slant guide slantness adjustment



・TG-5 Height adjustment (Only when the specification is not satisfied in REV × 10 mode or VAR × –1/30 mode)

<Unthreading end mode>



Tape-running Adjustment at Tape Exit Side

6-1-3. Video Tracking Check and Adjustment

Tools

- Alignment tape SR2-1 (For 525/60 system): 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system): 8-960-075-61
- Recording tape: Betacam SX Tape (BCT-SX series)
- Oscilloscope (Tektronix 2465B or equivalent)
- Adjustment mirror (circular): J-6080-029-A
- Tape guide adjustment driver (MW-261): J-6322-610-A

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

CH-1: TP500/EQ-75 board (A1A5 signal)
CH-2: TP100/EQ-75 board (A1A5 SEL signal)
TRIG: TP325/SS-83 board (SS GOP signal)

Oscilloscope setting:
CH-1: 200 mV/DIV
CH-2: 5 V/DIV
TIME: 2 ms/DIV

3. Set the Alignment Tape

Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

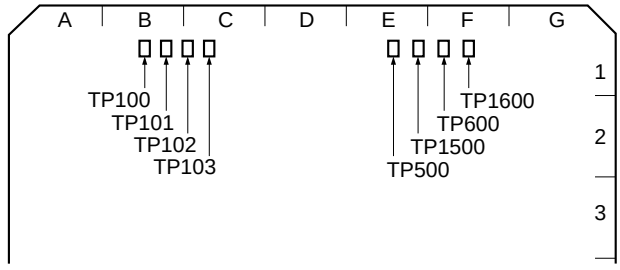
Check

4. Turn the Power On

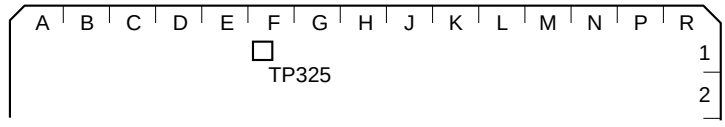
- Connection of the oscilloscope

  CH-1: TP500/EQ-75 board (A1A5 signal)
  CH-2: TP100/EQ-75 board (A1A5 SEL signal)
  TRIG: TP325/SS-83 board (SS GOP signal)

<EQ-75 board, side A>



<SS-83 board, side A>



Preparation

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5. Check the PB Head Head-to-tape Contact

(1) Play back the SR2-1/P (20:00 to 25:00).
(2) Push S100 switch on the SS-83 board more than 1 sec. so that the tracking VR becomes to be effective.
LED: Check that D112 lights up.
The waveform is displayed on the oscilloscope as shown in the figure.
(3) Turn the tracking VR so that the output level of the center portion of RF waveform of A1 channel is maximized.
(4) Check that RF waveform of A1 channel satisfies the spec.1 in a state of procedure (3).
(5) Maximize the output level of RF waveform of A5 channel, check that RF waveform of A5 channel satisfies the spec.1.
(6) Change the connections of CH-1 and CH-2 of the oscilloscope as follows, and perform the check from steps (1) through (5) in the same way.

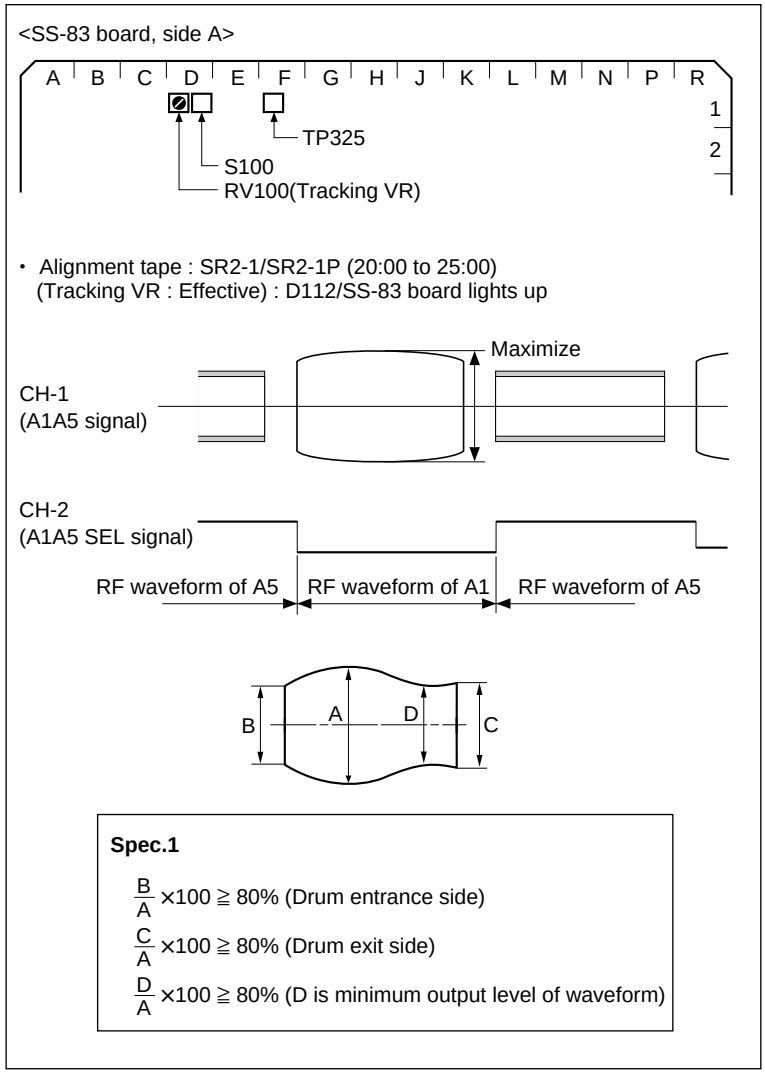
- CH-1: TP500, CH-2: TP100
- CH-1: TP600, CH-2: TP102
- CH-1: TP1500, CH-2: TP100
- CH-1: TP1600, CH-2: TP102

(All of these TPs are on the EQ-75 board.)

Note

The signal that is output from each TP is as shown below.

TP100 (A1A5 SEL signal)
TP102 (A2A6 SEL signal)
TP500 (A1A5 signal)
TP600 (A2A6 signal)
TP1500 (B1B5 signal)
TP1600 (B2B6 signal)



PB Head Head-to-tape Contact Check

6. CONFI Head Output Check

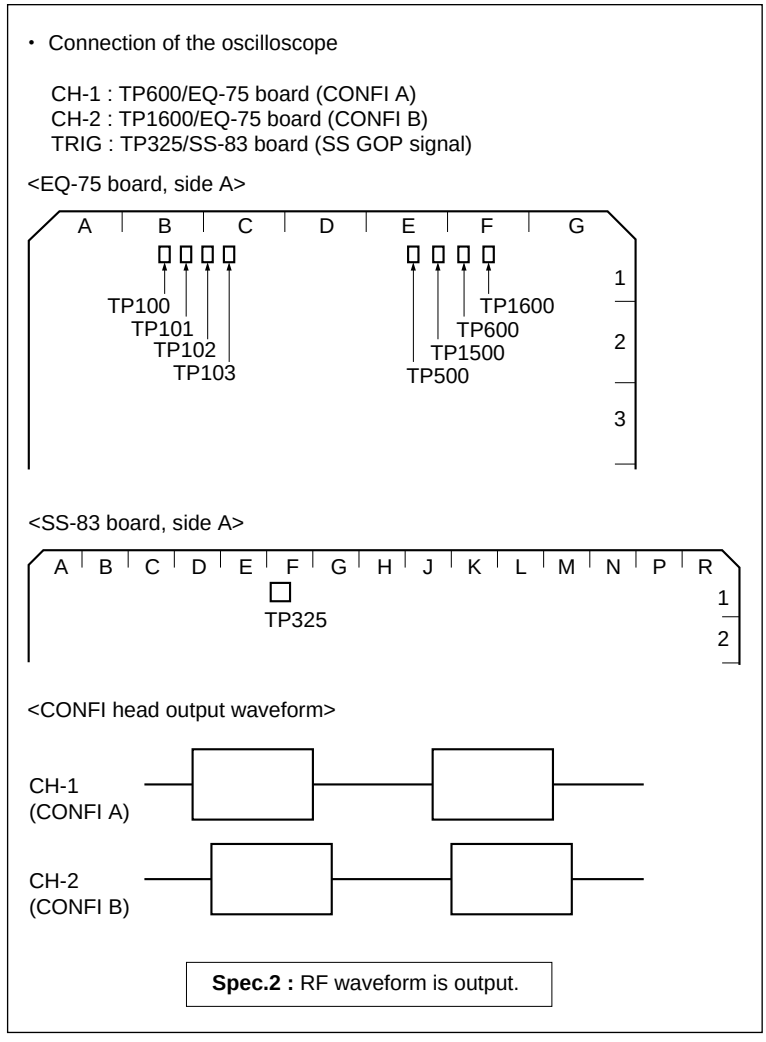
(1) Connect the oscilloscope.
CH-1: TP600/EQ-75 board (CONFI A)
CH-2: TP1600/EQ-75 board (CONFI B)
TRIG: TP325/SS-83 board (SS GOP signal)
Oscilloscope setting
CH-1: 20 mV/DIV
CH-2: 20 mV/DIV
TRIG: 5 V/DIV
TIME: 5 ms

(2) Press the EJECT button so that the unit put into the unthreading end state and remove the SR2-1/P.

(3) Set the recording SX tape and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

(4) Put the unit into the REC mode.

(5) Check that RF waveforms are output from CH-1 and CH-2 while is recording to the tape. (Specification 2)



CONFI Head Output Check

7. Mode Setting (REC Head PB)

(1) Press S1101 switch on the SS-83 board to enter the maintenance mode.

(2) Set the cursor "∗" to the "M0 : TAPE MAINTENANCE" and press the SET button.

(3) Set the cursor to the "A4: MECHANISM ADJUST" and press the SET button.

(4) Set the cursor to the "A40 : PATH MODE SEL" and press the SET button.

(5) Check that the "Switching PB" is indicated, and press the SET button.
Then, □ mark is indicated at the right up corner on the monitor.

Note

Refer to Section 3 for more information about the maintenance mode.

8. PLAY Mode

(1) Connect the oscilloscope.
CH-1: TP106/SS-83 board
(AB EVEN ENV signal)
TRIG: TP325/SS-83 board (SS GOP signal)
Oscilloscope setting:
CH-1: 200 mV/DIV
TRIG: 5 V/DIV
TIME: 1 ms/DIV

(2) Play back the SR2-1/P (00:00 to 15:00).

(3) Push S100 switch on the SS-83 board more than 1 sec. so that the tracking VR becomes to be effective.
LED: Check that D112/SS-83 board lights up.

(4) Turn the tracking VR so that the output level of RF envelope waveform is maximized.

(5) Turn RV100 on the SS-83 board clockwise so that the center portion of the RF envelope waveform makes 80% of the maximum output level.

(6) At the state of step (5), check that the RF envelope waveform satisfies specification 3.

Note

If the level fluctuates, read the average level.

(7) If the level fluctuates, turn RV100 on the SS-83 board so that the output level in the center portion of the RF envelope waveform is maximum, and check that the fluctuation amounts satisfy specification 4.

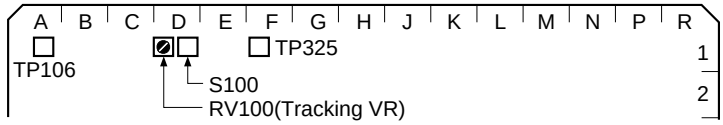
If specifications 3 and 4 are not satisfied, perform the adjustment (at the Tape Entrance Side or the Tape Exit Side) in steps 11 and later.

– Continued on the next page. –

• Connection of the oscilloscope

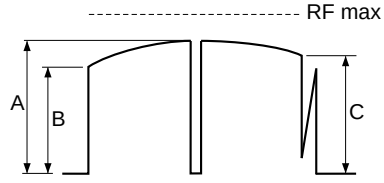
CH-1 : TP106/SS-83 board (AB EVEN ENV signal)
TRIG : TP325/SS-83 board (SS GOP signal)

<SS-83 board, side A>



• Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
(Tracking VR : Effective) : D112/SS-83 board lights up

<Head-to-tape contact>



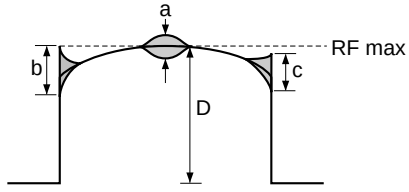
A = RF max × 0.8

Spec.3 : $\frac{B}{A} \times 100 \geqq 70\%$

$\frac{C}{A} \times 100 \geqq 70\%$

(Output levels (B and C) at the tape entrance side and exit side are more than 70% of the center level (A).)

<Fluctuation>



D = Average maximum level at waveform center

Spec.4 : $\frac{a}{D} \times 100 \leqq 20\%$

$\frac{b}{D} \times 100 \leqq 20\%$

$\frac{c}{D} \times 100 \leqq 20\%$

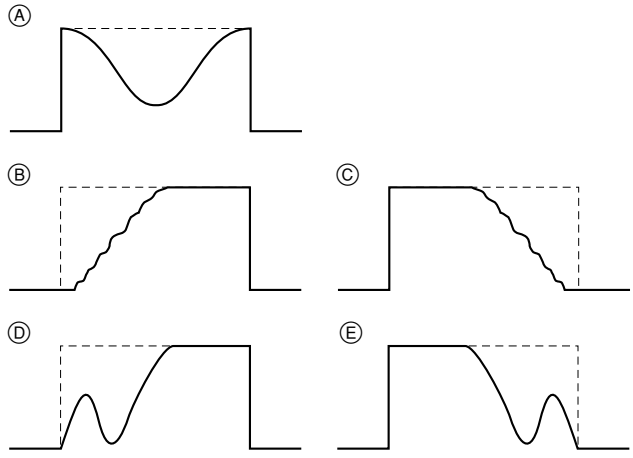
(Fluctuation amounts (a, b, c) at the drum center portion, entrance side and exit side are less than 20% of the average maximum level (D).)

If the output waveform is extremely abnormal condition as shown in Fig.1 after replacing the upper drum assembly, perform the upper drum replacement again.

- Upper drum assembly replacement
  (Refer to Section 5-2.)

<Fig. 1>

- Abnormal waveform (For example)



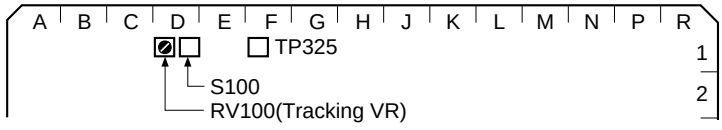
Video Tracking Check (PLAY)

9. F. FWD and REW Mode

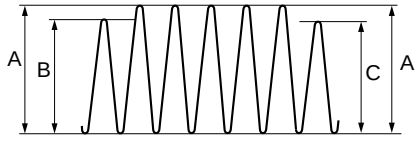
(1) Press the PLAY button and play back the SR2-1/P (00:00 to 15:00).
(2) Put the unit into the F. FWD mode and check that the RF waveform satisfies specifications 5 and 6.
(3) Put the unit into the REW mode and check that the RF waveform satisfies specifications 5 and 6.

If specifications 5 and 6 are not satisfied, perform the adjustment (at the Tape Entrance Side or Tape Exit Side) in steps 11 and later.

<SS-83 board, side A>



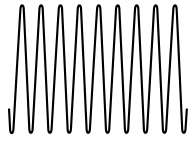
- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
  (Tracking VR : Not effective) : D112/SS-83 board lights out



Spec.5 : $\frac{B}{A} \times 100 \geqq 70\%$ (Tape entrance side)
$\frac{C}{A} \times 100 \geqq 70\%$ (Tape exit side)

- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
  (Tracking VR : Not effective) : D112/SS-83 board lights out

Spec.6 : No waveform lacking exists.



Video Tracking Check (F. FWD, REW)

10. REW Mode to PLAY Mode

(1) Play back the SR2-1/P (00:00 to 15:00).

(2) Put the unit into the REW mode once. Two or three seconds later, put the unit into the PLAY mode.

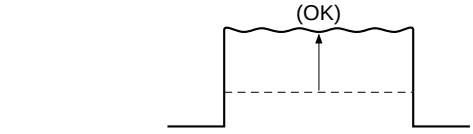
Check that the RF envelope waveform satisfies the specification 7.

- In case of the waveform become A, B or C Check that the output level (b) is more than 70% of the level in normal PLAY mode (a) and returns it to the level in normal PLAY mode within 1 second after servo locks up. (Specification 8)

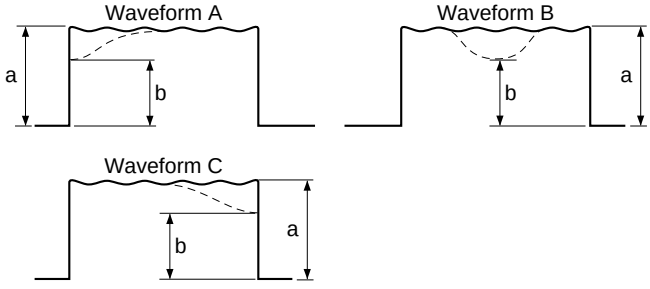
If specification 8 is not satisfied in waveform A or B shown in the figure, check the tape-running at the tape entrance side. (Refer to Section 6-1-2.)

If specification 8 is not satisfied in waveform C shown in the figure, check the tape-running at the tape exit side. (Refer to Section 6-1-2.)

- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
  (Tracking VR : Not effective) : D112/SS-83 board lights out



Spec.7 : The RF envelope waveform returns to the maximum level with the even level within 1 second after servo locks up (The SERVO indicator on the control panel lights up).



Spec.8 : The output level (b) is more than 70% of the level in normal PLAY mode (a) and returns it to the level in normal PLAY mode within 1 second after servo locks up.

Video Tracking Check (REW ⇨ PLAY)

Adjustment

Tape Entrance Side

11. Change the Mode Setting

(1) Press the SET button to cancel the SWITCHING PB mode.
(2) Turn the search dial while pressing the JOG button so that the “Full PB” is indicated, and press the SET button.

Note

After that, the overlap portion appears on the RF waveform.

12. Adjust the Tracking at Tape Entrance Side

(1) Play back the SR2-1/P (00:00 to 15:00).
(2) Push S100 switch on the SS-83 board more than 1 sec. so that the tracking VR becomes to be effective.
LED: Check that D112 lights up.
(3) Turn RV100 on the SS-83 board clockwise and adjust the center portion of the RF envelope waveform makes 80% of the maximum output level.
(4) Loosen the height adjustment nut of TG-2, and turn the upper flange so that the tape does not in contact with the upper flange of TG-2.
(5) Turn the height adjustment nut of TG-1 so that the overlap portion of the entrance side of the RF envelope waveform makes flat. (Fig. 1)

If the waveform does not make flat, perform the check described below.

① Clean the drum lead with a bamboo stick. (Refer to Section 2-2-4.)
② Press down the tape by bamboo stick very lightly and check that the tape is running along the drum lead.

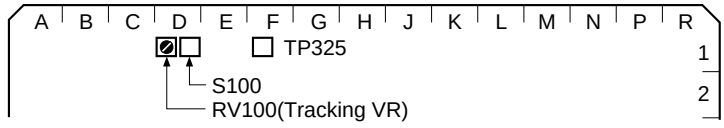
(6) Turn the height adjustment nut of TG-1 clockwise 30° more from the state of the step (5).

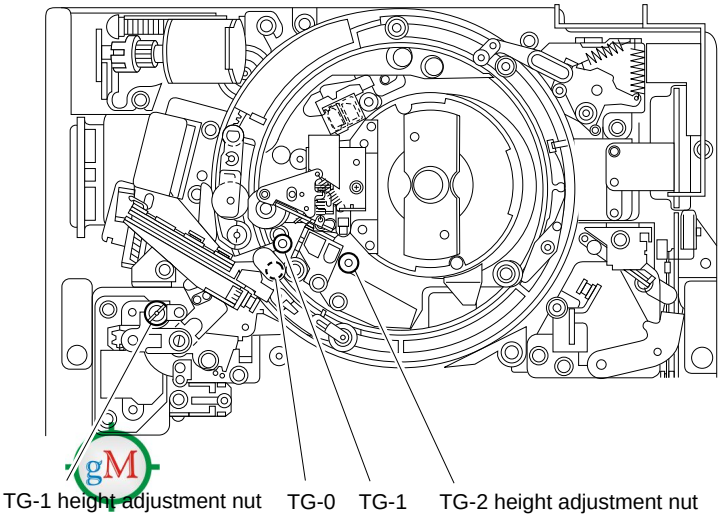
Note

Turning the height adjustment nut causes the waveform of the overlap portion to be not flat.

(7) Turn the height adjustment nut of TG-2 to clockwise so that the upper flange contacts the tape.

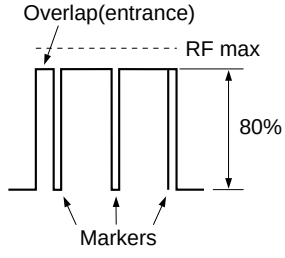
<SS-83 board, side A>

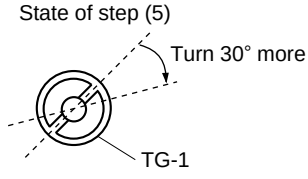




• Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
(Tracking VR : Effective) : D112/SS-83 board lights up

<Fig. 1>





– Continued on the next page. –

(8) Check that the levels A and B as shown in the figure satisfy the specification 9.

If the waveform is not satisfied the specification 9, perform the adjustment from step (1) again.

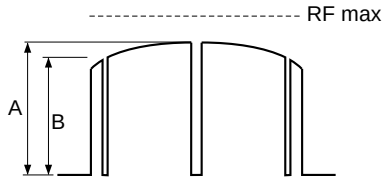
(9) Check the tape-running at the tape entrance side in the following modes.
- PLAY mode
- F. FWD mode
- REW mode
- REV × 1 mode
- VAR × −1/30 mode

If the tape curl does not satisfy the specification 10 at either TG-0, TG-1 or TG-2, perform the adjustments from the step (1) again.

13. Recheck the Video Tracking

Perform steps 5 through 10 again.

<Fig. 2>



A = RF max × 0.8

Spec.9 : $\frac{B}{A} \times 100 \geqq 70\%$

<Tape-running check at enyrance side>

Spec.10 : ① TG-0
The tape runs without any curl at the upper and lower flanges.

② TG-1(S Tention regulator)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

③ TG-2(Entrance guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

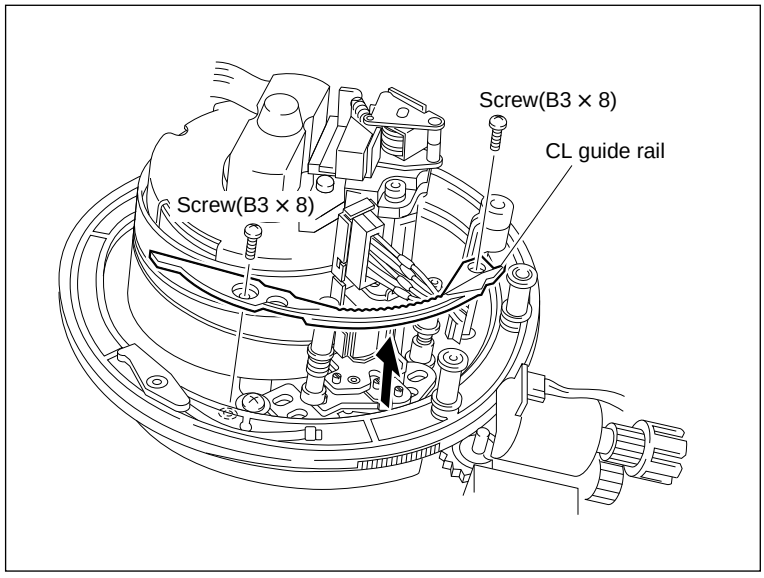
④ Lead of drum entrance side
The tape runs in contact with the drum lead and without any curl at the lead.

Tracking Adjustment at Tape Entrance Side

Tape Exit Side

14. CL Guide Rail Removal

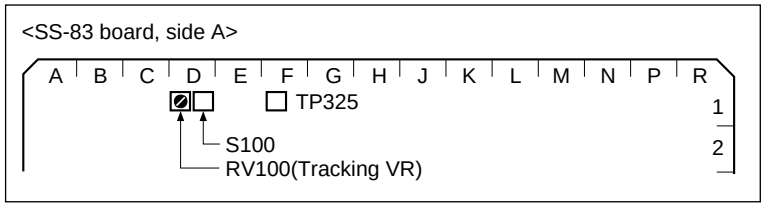
Remove the two screws, then remove the CL guide rail.



CL Guide Rail Removal

15. Tracking Adjust at Tape Exit Side

(1) Play back the SR2-1/P (00:00 to 15:00).
(2) Push S100 switch on the SS-83 board more than 1 sec. so that the tracking VR becomes to be effective.
LED: Check that D112 lights up.
(3) Turn RV100 on the SS-83 board clockwise and adjust the center portion of the RF envelope waveform to the maximum output level.



– Continued on the next page. –

(4) Turn the height adjustment nut of TG-3 counterclockwise by one to two turns so that the tape does not in contact with the upper flange of TG-3.

(5) Turn the height adjustment nut of TG-4 clockwise so that the tape does not in contact with the lower flange of TG-4.

(6) Turn the zenith adjustment screw of the AT head so that the right portion of the RF envelope waveform makes 20% or less of the maximum output level. (Fig. 1)
At this time, check that the tape does not in contact with both upper flange of TG-3 and lower flange of TG-4.
If the tape contacts either flange, repeat step (4) or (5).
If the tape moves upward or downward following the guide flange movement, perform the following adjustment.
This trouble cause is uneven tape tension at upside or downside of the tape caused by AT head zenith.
  - If the tape moves upward at TG-3:
    Turn the zenith adjustment screw counterclockwise.
  - If the tape moves downward at TG-4:
    Turn the zenith adjustment screw clockwise.

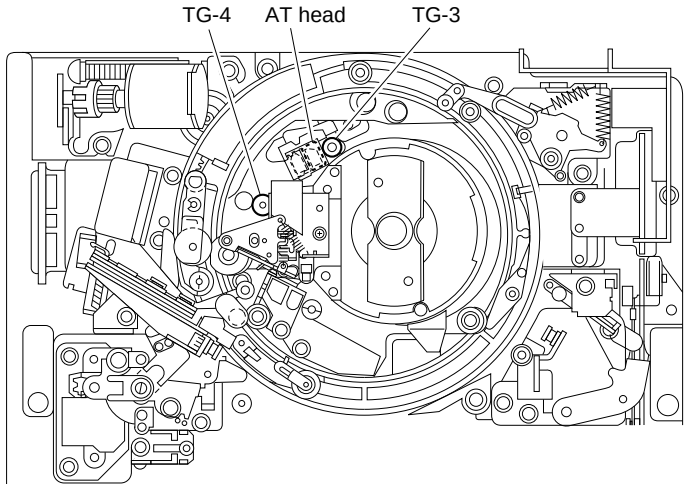
(7) Turn the height adjustment nut of TG-3 so that the tape is in contacts with the upper flange and the RF envelope waveform becomes flat. (Fig. 2)
At this time, the tape does not in contact with the lower flange of TG-4.

If the waveform does not become flat, perform the check and adjustment below.

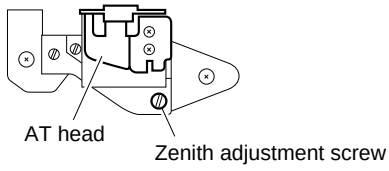
① Clean the drum lead with a bamboo stick. (Refer to Section 2-2-4.)

② Press down the tape by bamboo stick very lightly and check that the tape is running without aparting from the drum lead.

③ If the waveform does not become flat even though steps ① and ② mentioned above are performed, adjust the height of TG-3 so that the RF envelope waveform is nearly flat within the range of the specification 11 shown in the Fig.3. At this time, do not overpress the tape at TG-3.

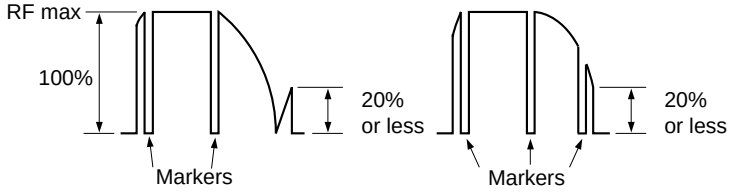


- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)

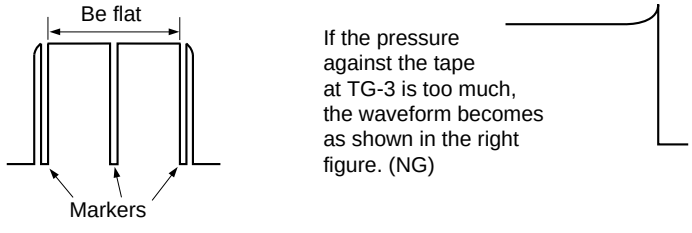


- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
  (Tracking VR : Effective) : D112/SS-83 board lights up

<Fig. 1>



<Fig. 2>



– Continued on the next page. –

Note

When adjusting the height of TG-3 in step ③, be sure to check the height of AT head (Refer to Section 6-1-6). If the AT head height does not satisfy the specification, repeat the video tracking adjustment.

(8) Adjust the height of TG-4 so that the lower flange of TG-4 in contact with the tape.
(9) Check the tape-running at the tape exit side in the following modes.
- PLAY mode
- F. FWD mode
- REW mode
- REV × 1 mode
- VAR × −1/30 mode

If the tape curl does not satisfy the specification 12 at TG-3, perform the following adjustments while observing the waveform.

① Change the zenith of the AT head within the range of the specification shown in Fig. 1.
② Perform the tracking adjustment again. (Refer to steps (1) through (9) mentioned above.)
③ (In case of the adjustment is performed the AT head zenith)
Perform the checks and adjustments described below.
- AT head height (Refer to Section 6-1-6.)
- AT head position (Refer to Section 6-1-7.)

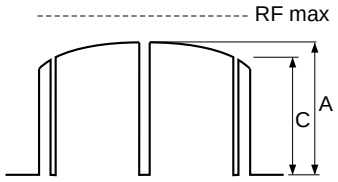
16. Recheck the Video Tracking

Perform the steps 5 through 10 again.

17. Attach the CL Guide Rail

Attach the CL guide rail with two screws.

<Fig. 3>



A = RF max × 0.8

Spec.11 : $\frac{C}{A} \times 100 \geqq 70\%$

<Tape-running check>

Spec.12 : ⑤ Lead of drum exit side
The tape runs without any curl at the lead.

⑥ TG-3 (Exit guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

⑦ TG-4
The tape runs in contact with the lower flange.
The tape curl is less than 1/10 of the tape width.

⑧ TG-5 (Threading roller)
The tape runs without any curl at the upper and lower flanges.

Tracking Adjustment at Tape Exit Side

http://getMANUAL.com

6-1-4. CTL Head Height Check and Adjustment

Tools

- Alignment tape SR2-1 (For 525/60 system): 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system): 8-960-075-61
- Oscilloscope (Tektronix 2465B or equivalent)
- Tape guide adjustment driver (MW-261): J-6322-610-A

Preparation

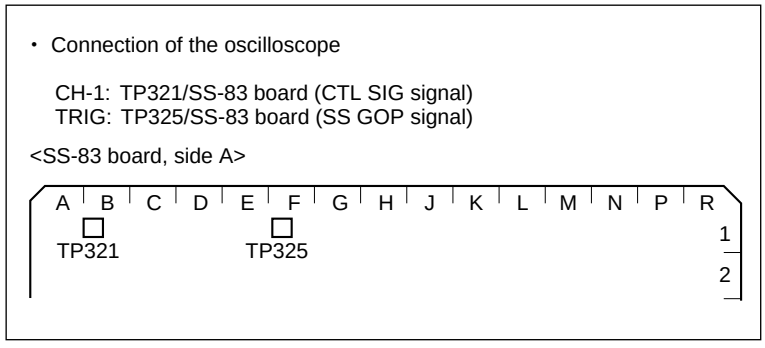
1. Turn the Power Off

2. Connect the Oscilloscope

CH-1 : TP321/SS-83 board (CTL signal)
TRIG : TP325/SS-83 board (SS GOP signal)
Oscilloscope setting :
CH-1 : 2 V/DIV
TIME : 5 ms/DIV

3. Set the Alignment Tape

Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.



Preparation

Check

4. Turn the Power On

5. Play Back the Alignment Tape

Play back the SR2-1/P (15:00 to 27:00).

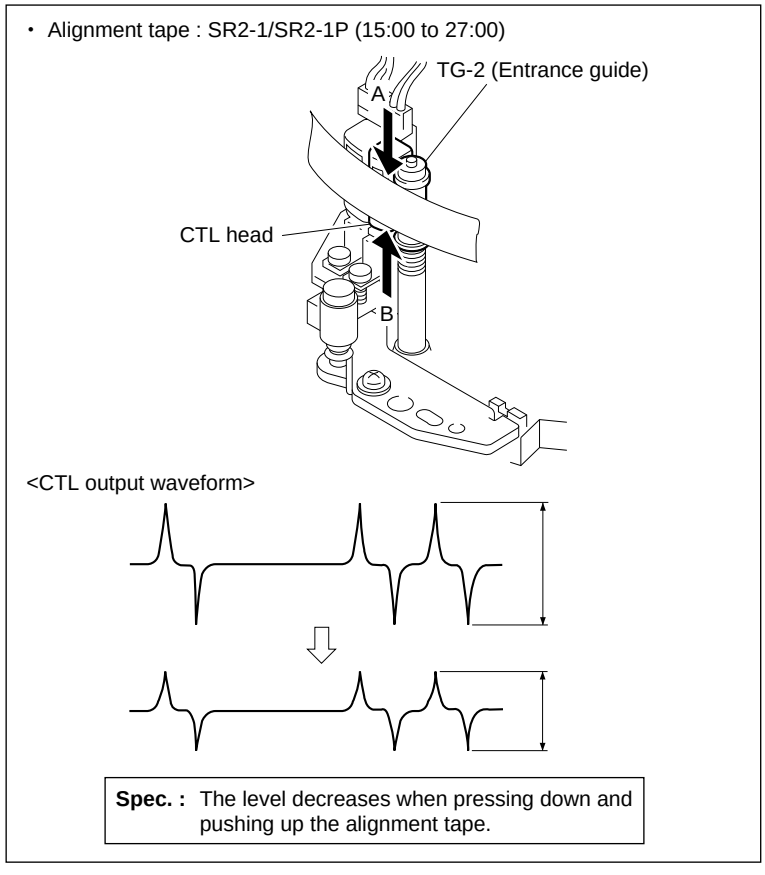
6. Check the CTL Head Height

(1) Check that the level decreases when portion A of the tape shown in the figure is pressed down.

If the level increases, perform step 7.

(2) Check that the level decreases when portion B of the tape is pushed up.

If the level increases, perform step 8.



CTL Head Height Check

Adjustment

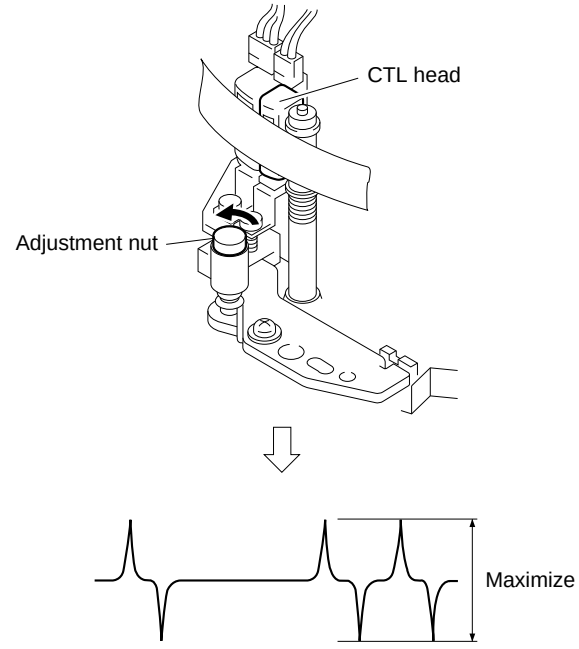
7. In Case the Level Increases when the Tape is Pressed Down (Fig. 1)

Turn the adjustment nut counterclockwise and adjust so that the output waveform is maximum.

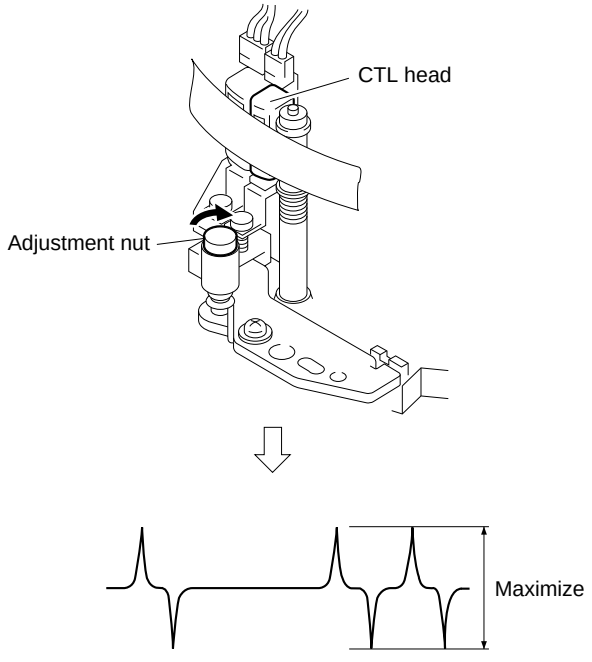
8. In Case the Level Increases when the Tape is Pushed Up (Fig. 2)

Turn the adjustment nut clockwise and adjust so that the output waveform is maximum.

<Fig. 1>



<Fig. 2>



CTL Head Height Adjustment

6-1-5. CTL Head Position Check and Adjustment

Note

The CTL head position adjustment is closely related to the AT head position adjustment.
Be sure to confirm the AT head position when the CTL head position is adjusted.

Tools

- Alignment tape SR2-1 (For 525/60 system): 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system): 8-960-075-61
- Oscilloscope (Tektronix 2465B or equivalent)

Preparation

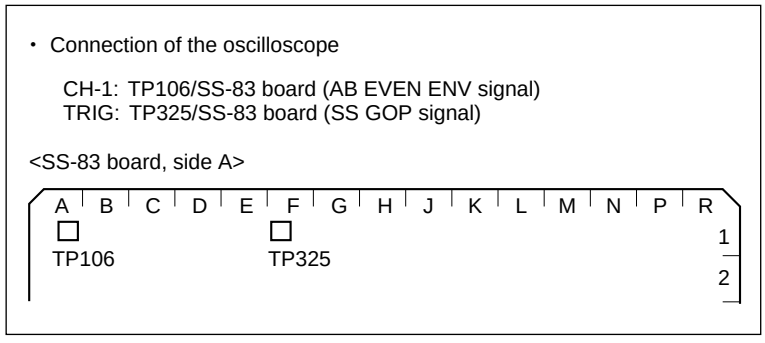
1. Turn the Power Off

2. Connect the Oscilloscope

CH-1: TP106/SS-83 board (AB EVEN ENV signal)
TRIG: TP325/SS-83 board (SS GOP signal)
Oscilloscope setting :
CH-1 : 1 V to 200 mV/DIV
TRIG : 5 V/DIV
TIME : 5 ms/DIV

3. Set the Alignment Tape

Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.



Preparation

Check

4. Turn the Power On

5. Mode Setting (REC Head PB)

(1) Press S1101 switch on the SS-83 board to enter the maintenance mode.
(2) Set the cursor "✻" to the "M0 : TAPE MAINTENANCE" and press the SET button.
(3) Set the cursor to the "A4 : MECHANISM ADJUST" and press the SET button.
(4) Set the cursor to the "A40 : PATH MODE SEL" and press the SET button.
(5) Check that the "Switching PB" is indicated, and press the SET button.

Note

Refer to Section 3 for more information about the maintenance mode.

6. Play Back the Alignment Tape

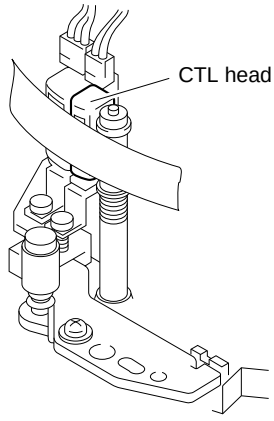
Play back the SR2-1/P (00:00 to 15:00).

7. Check the CTL Head Position

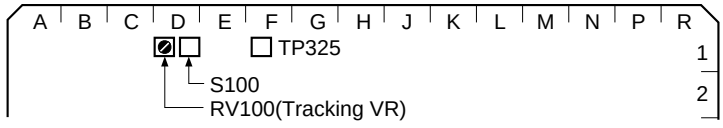
(1) Check that the marker exists in the RF envelope waveform that comes 15 ms later than the rising edge of the SS GOP signal.
(2) Push S100 switch on the SS-83 board more than 1 sec. so that the tracking VR becomes to be effective.
LED: Check that D112 lights up.
(3) Turn RV100 (tracking VR) on the SS-83 board so that the output level at the center portion of the RF envelope waveform is maximum and read the maximum level as Lv.
(4) Push S100 switch on the SS-83 board more than 1 sec. to fix the tracking VR.
LED: Check that D112 lights out.
(5) Read the output level at the center portion of the RF envelope waveform as LF.
(6) Check that the levels Lv and LF satisfy the specification 2.

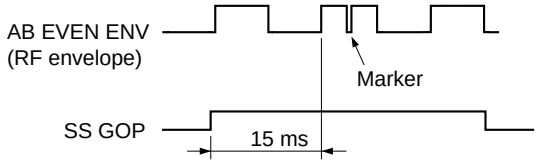
If the specification is not satisfied, perform steps 8 and later.

• Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
(Tracking VR : Effective) : D112/SS-83 board lights up



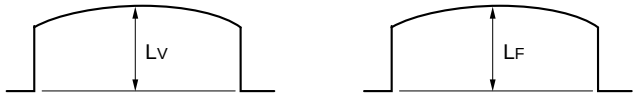
<SS-83 board, side A>





Spec.1 : The marker exists in the RF envelope waveform (REC head PB) that comes 15 ms later than the rising edge of the SS GOP signal.

(Tracking control : Effective state) (Tracking control : Non effective state)



$$\frac{L_F}{L_V} \geqq 0.8$$

Spec.2 : When the tracking VR is not effective, the output level at the center portion of the RF envelope waveform (LF) is 80% and more against the maximum output level (Lv) under the state of the tracking is effective.

CTL Head Position Check

Adjustment

Note

Perform the adjustment described below under the state of the tracking is not effective.

8. Loosen the Screw

Loosen the securing screw of the CTL/FE head assembly by 1/4 to 1/2 turn.

9. Adjust the CTL Head Position

(1) Insert a 3 mm flatbladed screwdriver into the notch of the CTL/FE head assembly.
(2) Adjust the CTL/FE head assembly position so that the output level at the center portion is maximum and the marker exists in the RF envelope waveform that comes 15 ms later than the rising edge of the SS GOP signal.

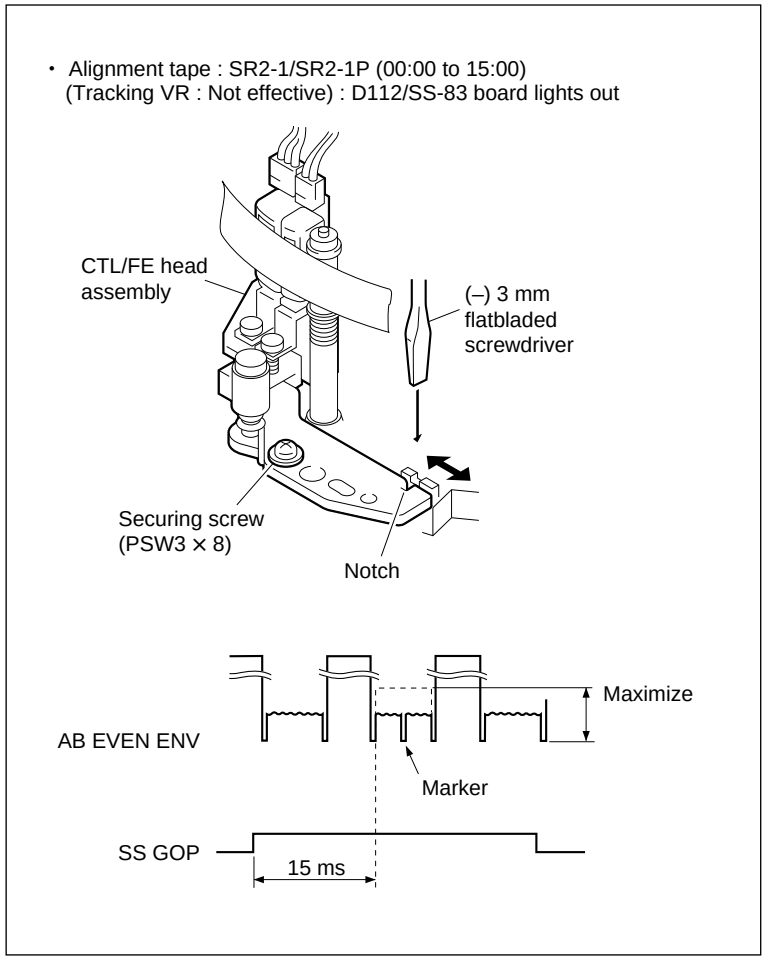
10. Tighten the Screw

Tighten the screw loosened in step 8.

Tightening torque: 98×10^{-2} N•m
{10.0 kgf • cm}

11. Recheck the CTL Head Position

Perform to steps 5 through 7 again.



CTL Head Position Adjustment

In Case the Adjustment is Performed

12. Adjust the AT Head Position

Refer to Section 6-1-7.

13. Apply the Locking Compound

Refer to Section 6-1.

6-1-6. AT Head Height Check and Adjustment

Note

The AT head height adjustment is closely related to the head position adjustment. Be sure to perform adjustments (or checks) according to “In Case the Adjustment is Performed” in this section when the AT head height is adjusted.

Tools

- Alignment tape SR2-1 (For 525/60 system): 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system): 8-960-075-61
- Oscilloscope (Tektronix 2465B or equivalent)

Preparation

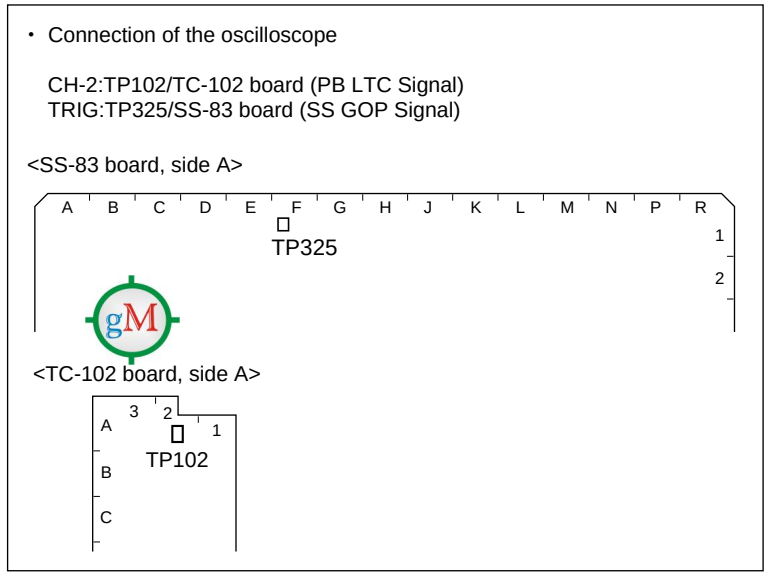
1. Turn the Power Off

2. Connect the Oscilloscope

CH-2 : TP102/TC-102 board (PB LTC signal)
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 5 ms/DIV

3. Set the Alignment Tape

Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.



Preparation

Check

4. Turn the Power On

5. Play Back the Alignment Tape

Play back the SR2-1/P (0:00 to 15:00).

6. Check the AT Head Height

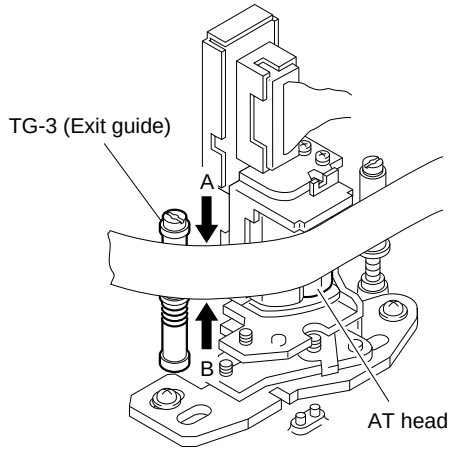
(1) Check that the level of CH-2 remains unchanged when portion A of the tape is lightly pushed downward.

If the level is changed, perform steps 7 and 8.

(2) Check that the level of CH-2 decrease when portion B of the tape is lightly pushed up.

If the level increase, perform steps 7 and 8.

・ Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)



<PB LTC output waveform>

Spec.1 : Level remains unchanged by pushing the tape downward.
Level decreases by pushing the tape upward.

AT Head Height Check

Adjustment

7. Adjust the AT Head Height (Fig. 1)

(1) Turn the height adjustment screw so that the output level A is maximum (position “a”).

(2) Gradually turn the height adjustment screw counterclockwise and stop where the output level starts to decrease (position “b”).

Notes

- Never loosen or remove the azimuth adjustment screw.
- To stabilize the AT head height after the adjustment, set the maximum output level with the AT head moved from bottom to top (with the height adjustment screw turned clockwise).

8. Check the AT Head Height (Fig. 2)

While playing back an alignment tape SR2-1/ SR2-1P (15:00 to 20:00), check that the waveform of TC data is output.

In Case the Adjustment is Performed

9. Adjust the AT Head Position

Refer to Section 6-1-7.

10. Recheck the AT Head Height

Refer to steps 5 and 6 in this section.

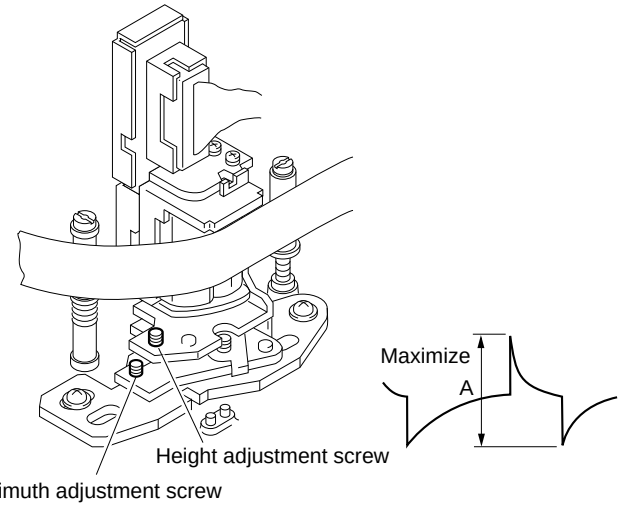
11. Recheck the AT Head Position

Refer to Section 6-1-7.

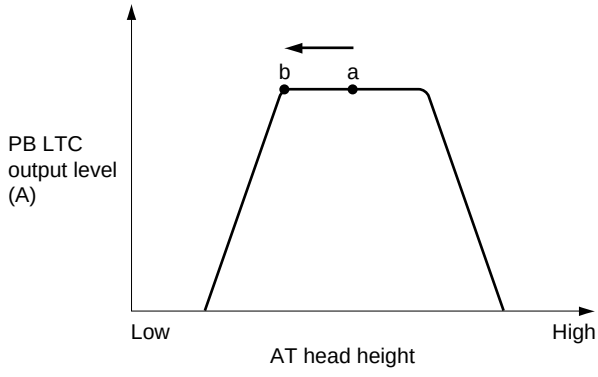
12. Apply the Locking Compound

Refer to Section 6-1.

<Fig. 1>

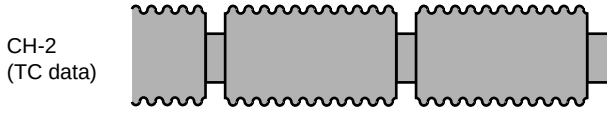


Gradually turn the height adjustment screw counterclockwise so that adjust the output level to position “b” from position “a”.



<Fig. 2>

- Alignment tape : SR2-1/SR2-1P (15:00 to 20:00)



Spec.2 : Outputs the waveform of LTC data.

AT Head Height Adjustment

6-1-7. AT Head Position Check and Adjustment

Notes

- The CTL head position adjustment should be completed before performing this adjustment. The AT head position is adjusted with the CTL head position as reference.
- The AT head position adjustment is closely related to the head height adjustment. Be sure to perform adjustments (or checks) according to “In Case the Adjustment is Performed” in this section when the AT head position is adjusted.

Tools

- Alignment tape SR2-1 (For 525/60 system): 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system): 8-960-075-61
- Oscilloscope (Tektronix 2465B or equivalent)

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

CH-1 : TP304/SS-83 board (CTL PULSE signal)
CH-2 : TP102/TC-102 board (PB LTC signal)
TRIG : TP325/SS-83 board (SS GOP signal)
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 5 ms to 500 µs/DIV

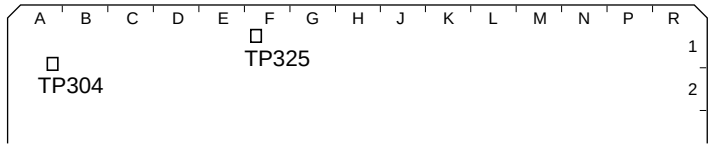
3. Set the Alignment Tape

Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

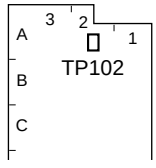
- Connection of the oscilloscope

CH-1:TP304/SS-83 board (CTL PULSE Signal)
CH-2:TP102/TC-102 board (PB LTC Signal)
TRIG:TP325/SS-83 board (SS GOP Signal)

<SS-83 board, side A>



<TC-102 board, side A>



Preparation

Check

4. Turn the Power On

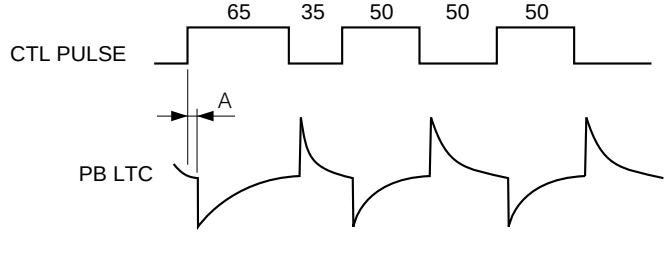
5. Play Back the Alignment Tape

Play back the SR2-1/P (00:00 to 15:00).

6. Check the AT Head Position

Check that the positional relationship between the rising edges of CTL's 65:35 pulse and PB LTC's 65:35 waveform signals satisfies the specification.
If the specification is not satisfied, perform steps 7 and later.

- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)



Spec. : A = 0 ±600 µs

AT Head Position Check

Adjustment

7. Remove the CL Guide Rail
Remove the two screws, then remove the CL guide rail.

8. Loosen the Screws
Loosen the two securing screws of the AT head assembly by 1/4 to 1/2 turn.

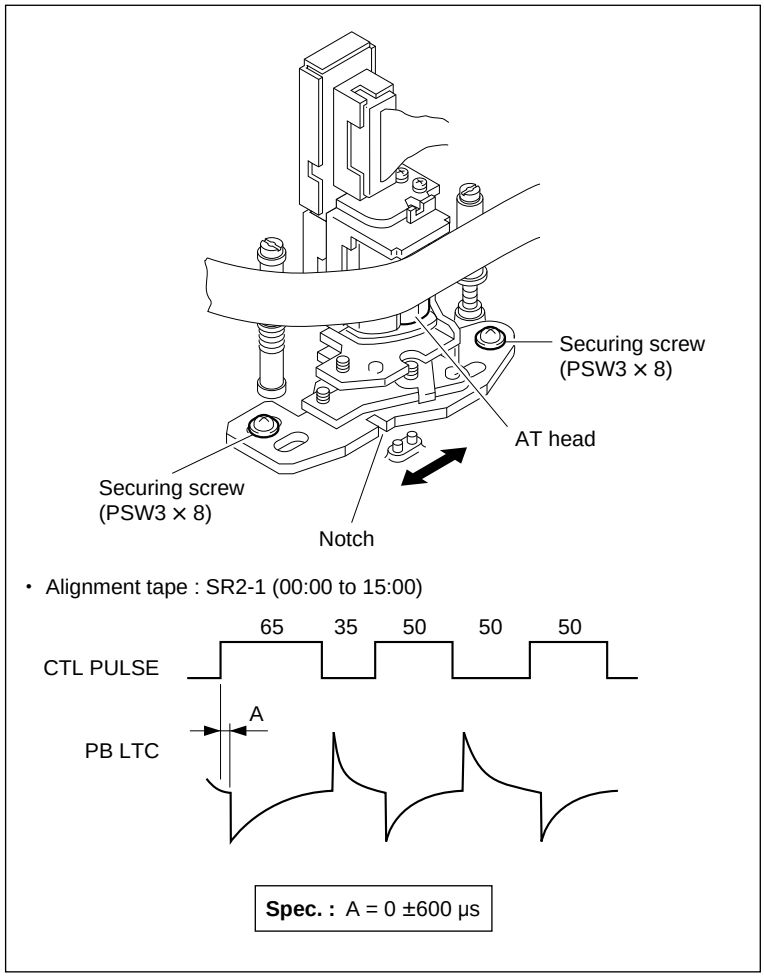
9. Adjust the AT Head Position
(1) Insert a 3 mm flatbladed screwdriver into the notch of the AT head assembly.
(2) Adjust the AT head assembly position so that the specification is satisfied.

10. Tighten the Screws
Tighten the two screws loosened in step 8.

Tightening torque: 98×10^{-2} N•m
{10.0 kgf • cm}

11. Recheck the AT Head Position
Refer to steps 5 and 6 in this section.

12. Attach the CL Guide Rail Installation
Attach the CL guide rail with two screws.



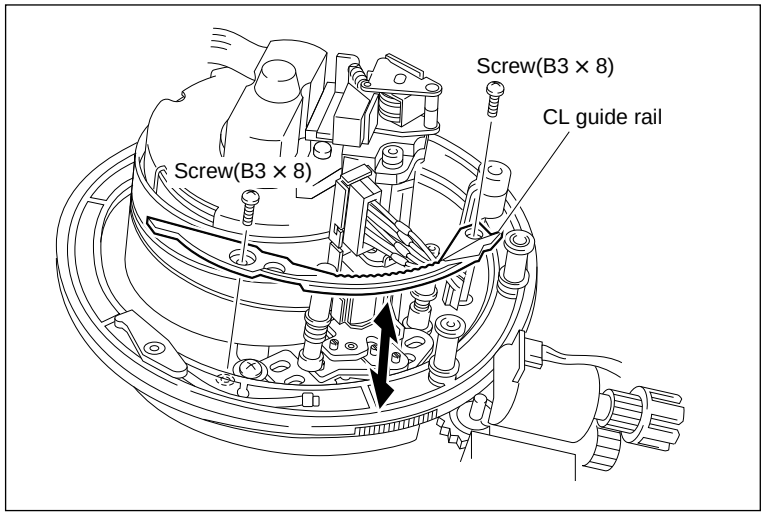
AT Head Position Adjustment

In Case the Adjustment is Performed

13. Check the AT Head Height
Refer to Section 6-1-6.

14. Check the AT Head Position
Refer to steps 5 and 6 in this section.

15. Apply the Locking Compound
Refer to Section 6-1.



Removing/Attaching the CL Guide Rail

http://getMANUAL.com

6-1-8. LTC Level Check and Adjustment in REV Mode

Tools

- Alignment tape SR2-1 (For 525/60 system): 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system): 8-960-075-61
- Oscilloscope (Tektronix 2465B or equivalent)
- Betacam cassette (S cassette): BCT-30MA
- Adjustment mirror (circular): J-6080-029-A
- Tape guide adjustment driver (MW-261): J-6322-610-A

Preparation

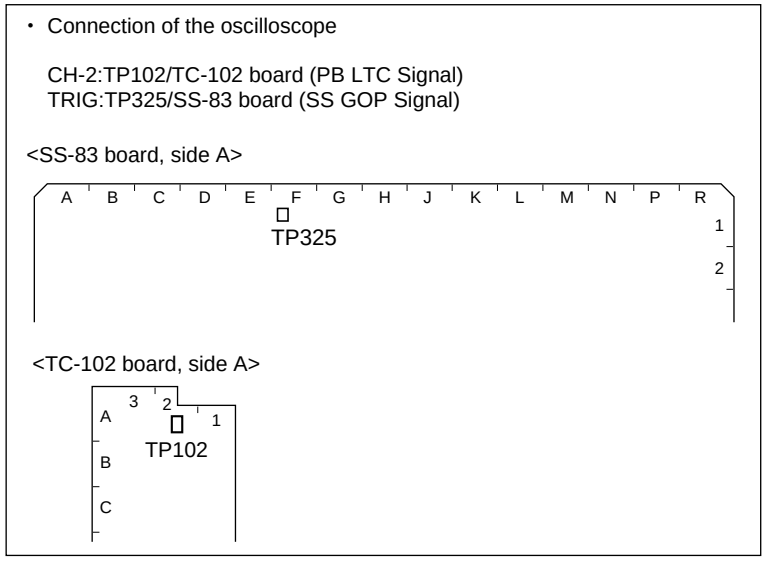
1. Turn the Power Off

2. Connect the Oscilloscope

CH-2 : TP102/TC-102 board (PB LTC signal)
TRIG : TP325/SS-83 board (SS GOP signal)
Oscilloscope setting :
CH-2 : 100 mV/DIV
TIME : 5 ms/DIV

3. Set the Alignment Tape

Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.



Preparation

Check

4. Turn the Power On

5. Play Back the Alignment Tape

Play back the SR2-1/P (0:00 to 15:00).

6. Check the LTC Output Level

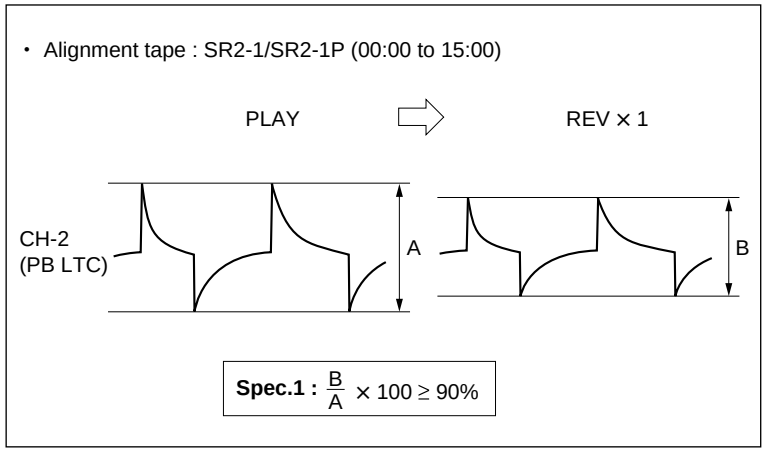
Check the LTC output level A in CH-2.

7. Put the Unit into the REV × 1 Mode

8. Check the LTC Output Level

Check that the LTC output level B in CH-2 satisfies specification 1.

If specification 1 is not satisfied, perform steps 9 and later.



LTC Level Check in REV Mode

Adjustment

9. Adjust the TG-5 (Threading Roller) Height

(1) Play back the SR2-1/P (00:00 to 15:00).
(2) Put the unit into the REV × 1 mode.
(3) In case the level increases when portion A of the tape shown in the figure is pressed down, turn the upper flange of TG-5 clockwise using a tape guide adjustment driver.
In case the level increases when portion B is pushed up, turn the upper flange of TG-5 counterclockwise.

Note

First, press the EJECT button to unthread the tape when turning the upper flange of TG-5.

(4) Check the LTC output level satisfies specification 1. (Refer to steps 5 through 8.)

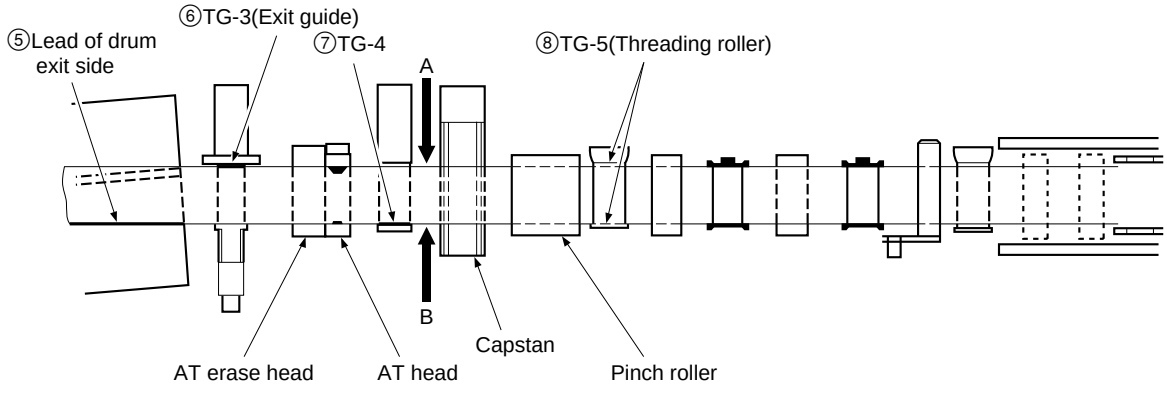
If the specification 1 is not satisfied, repeat steps (1) through (3) mentioned above.

10. Check the Tape-running at Tape Exit Side

In the modes below, check that the tape-running condition satisfies specification 2.
(1) PLAY mode
(2) REV × 1 mode

If specification 2 is not satisfied, adjust the tape guides height at the tape exit side. (Refer to steps 12 through 14 (at the Tape Exit Side) in Section 6-1-2.)

If the height of the tape guide is adjusted, perform the video tracking check.
(Refer to Section 6-1-3.)



Spec.2 : ⑤ Lead of drum exit side
The tape runs in contact with the drum lead and without any curl at the lead.

⑥ TG-3(Exit guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

⑦ TG-4
The tape runs in contact with the lower flange.
The tape curl is less than 1/10 of the tape width.

⑧ TG-5(Threading roller)
The tape runs without any curl at the upper and lower flanges.

LTC Level Adjustment in REV Mode

Section 7
Electrical Alignment after Main Parts Replacement

7-1. Electrical Alignment Overview

7-1-1. Notes on Electrical Alignment

- Be sure to perform the adjustment in order.
- Never touch (or turn) the adjustment part carelessly.
- Do not execute automatic adjustment carelessly, and do not change adjustment data carelessly.
  If executed or changed carelessly, turn off the power of the VTR or execute “ALL DATA PREVIOUS” in each NV-RAM control menu so as not to save the data.

  Note

  NV-RAM control menu for the servo system have no function “ALL DATA PREVIOUS”.
  If executed carelessly the automatic adjustment, turn off the power of the VTR.
- For details on the maintenance mode, refer to Section 3.
- Before beginning adjustment, it is recommended to make a copy of check sheets given in the installation manual “Appendix A” and write down setup conditions such as switches’ setting in the check sheets.
  If setup conditions are noted, the settings can be returned easily to its original condition after finishing adjustment.

7-1-2. Outline of Electrical Alignment

In Section 7 explains the electrical alignment after replacing the following parts.

- Drum assembly / Upper drum assembly ..... Section 7-2
- AT head ..... Section 7-3

7-2. Electrical Adjustment after Replacing the Drum

7-2-1. Adjustment Overview

Perform this section when the drum assembly or upper drum assembly was replaced.

For adjustment items and its order, refer to “Adjustment Items”.

Note

During adjusting, be sure to reattach the upper lid.

Tools List

To perform the adjustment after replacing the drum, prepare the following equipment and fixtures.

- Analog component video monitor

  Note

  Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Recording tape: BCT-SX series (Betacam SX cassette) (Sony’s standard products)

  Note

  For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.
- Alignment tapes

  For DNW-75: SR2-1 (Part No. 8-960-075-11) and
  SR5-1 (Part No. 8-960-075-01)
  For DNW-75P: SR2-1P (Part No. 8-960-075-61) and
  SR5-1P (Part No. 8-960-075-51)

Adjustment Items

No.	Item		Adjustment point	Remarks
7-2-3	Drum phase adjustment		A11 : RF SWITCHING POS.	(Automatic adjustment)
		Data save	A12 : NV-RAM CONTROL	
7-2-4	EQ equalizer adjustment		A11 : EQUALIZER	(Automatic adjustment)
		Data save	A1F : NV-RAM CONTROL	
7-2-5	Recording current adjustment		A12 : REC CURRENT	(Automatic adjustment)
		Data save	A1F : NV-RAM CONTROL	

7-2-2. Common Preparation

Perform the settings (switches, setup extend menu, etc.) toward the VTR before starting the adjustments.
Return they settings to the customer settings after completing the electrical adjustment.

1. Set the VTR's switches as follows:

Location Item		Customer setting	Setting at adjustment
Sub control panel			
CHARACTER switch		_____	⇨ ON
REC INHIBIT switch		_____	⇨ OFF
KEY INHIBIT switch		_____	⇨ OFF
Upper control panel			
REMOTE:	9P	_____	⇨ Off (Light off)
	50P	_____	⇨ Off (Light off)

2. For DNW-75, be sure to adjust in the 525/60 system. For DNW-75P, be sure to adjust in the 625/50 system. If differed, change the operation system using the setup menu ITEM-013 before adjusting. (For the ITEM-013, refer to Section 7-2-2 of the operation manual.)

7-2-3. Drum Phase Adjustment

Prepare the following alignment tape to perform this adjustment.
DNW-75: SR2-1 (for 525/60 system)
DNW-75P: SR2-1P (for 625/50 system)

1. Insert the alignment tape SR2-1 or SR2-1P, then advances it to the time code 00:25:00:00.
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A011 : RF SWITCHING POS.
   - The alignment tape is ejected on the way to menu A011.
4. Select "AUTO".
5. Insert this alignment tape again, then the adjustment is executed automatically.
   - Message "ADJUST COMPLETE" is displayed on the video monitor when this automatic adjustment is completed normally.
6. To exit this menu, press the MENU button once.

Data save (Store the adjusted data)

7. Enter A012 : NV-RAM CONTROL, then execute "SAVE SERVO ADJUST DATA".
   - Message "DATA SAVED" is displayed on the video monitor when this data save is completed normally.

8. To exit the maintenance mode, press the MENU button five times.
9. Eject the alignment tape.

7-2-4. EQ Equalizer Adjustment

Prepare the following alignment tape to perform this adjustment.
DNW-75: SR5-1 (for 525/60 system)
DNW-75P: SR5-1P (for 625/50 system)

1. Insert the alignment tape SR5-1 or SR5-1P, then search it in time code 00:03:00:00.
2. To enter the maintenance mode, press S1101 (L-1) of the SS-83 board.
3. Enter A11 : EQUALIZER.
   - Message “Auto Adjust (Push SET)” is displayed on the video monitor.
4. Check that there is the ∗ mark to “ALL” on the video monitor.
   If not, set the ∗ mark to “ALL” with the search dial turned.
5. To execute the automatic adjustment, press the SET button once.
   - Message “Auto Adjust Complete” is displayed on the video monitor when this adjustment is completed normally.
6. To exit the maintenance mode, press the MENU button four times.
7. Eject the alignment tape.

Data save (Store the adjusted data)

8. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
9. Enter A1F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

10. To exit the maintenance mode, press the MENU button four times.

7-2-5. Recording Current Adjustment

Prepare the recording tape to perfome this adjustment.

1. Insert the recording tape.
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A12 : REC CURRENT.
   - Message “Auto Adjust (Push SET)” is displayed on the video monitor.
4. Check that there is the ∗ mark to “ALL” on the video monitor.
   If not, set the ∗ mark to “ALL” with the search dial turned.
5. To execute the automatic adjustment for the recording current, press the SET button once.
   - Message “Auto Adjust Complete” is displayed on the video monitor when this adjustment is completed normally.
6. To exit the maintenance mode, press the MENU button four times.
7. Eject the recording tape.

Data save (Store the adjusted data)

8. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
9. Enter A1F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

10. To exit the maintenance mode, press the MENU button four times.

7-3. Electrical Adjustment after Replacing the AT Head

7-3-1. Adjustment Overview

Perform this section when the AT head was replaced.

For adjustment items and its order, refer to “Adjustment Items”.

Tools List

To perform the electrical adjustments, the following equipment and fixtures are required.

- Audio signal generator: TEKTRONIX SG505-option 02 or equivalent
- Audio level meter: HEWLETT-PACKARD HP3400A or equivalent
- Band-pass filter (1 kHz)
- Time code generator: SONY BVG-1600 (for NTSC) / BVG-1600PS (for PAL) or equivalent
- Time code reader: SONY BVG-1500 (for NTSC) / BVG-1500PS (for PAL) or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Shorting clip
- Alignment tape
  For DNW-75: SR5-1 (Part No. 8-960-075-01)
  For DNW-75P: SR5-1P (Part No. 8-960-075-51)
- Recording tape: BCT-SX series (Betacam SX cassette: Sony’s standard products)

Note

For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.

Adjustment Items

No.	Item	Adjustment point	Test point
7-3-2	Preparation		
7-3-3	LTC Erasure current adjustment	⊘LV300/TC-102(A-1)	TP301/TC-102(B-1), TP300/TC-102(B-1)
7-3-4	LTC PB level check	check	TP102/TC-102(A-2)
7-3-5	LTC OA check	check	TP100/TC-102(A-3), TP101/TC-102(A-2)
7-3-6	LTC Erase ratio check	check	TP102/TC-102(A-2)

7-3-2. Common Preparation

Perform the settings of the control panels toward the VTR before starting the adjustments.
Return they settings to the customer settings after completing the electrical adjustment.

1. Settings

Location	Item		Customer setting	Setting at adjustment
Upper control panel	TC	LTC/AUTO/VISC	_____	⇨ LTC
	TC GENERATOR	INT/EXT	_____	⇨ INT
		PRESET/REGEN	_____	⇨ REGEN
		FREE RUN/REC RUN	_____	⇨ REC RUN
	REMOTE	9P	_____	⇨ Off (Light off)
		50P	_____	⇨ Off (Light off)
Sub control panel	CHARACTER switch		_____	⇨ ON
	REC INHIBIT switch		_____	⇨ OFF
	KEY INHIBIT switch		_____	⇨ OFF

2. Video system check

Be sure to adjust in the following system.
DNW-75: 525/60 system
DNW-75P: 625/50 system

If differed, change the video system using the setup menu ITEM-013 before adjusting.
(For the ITEM-013, refer to Section 7-2-2 of the operation manual.)

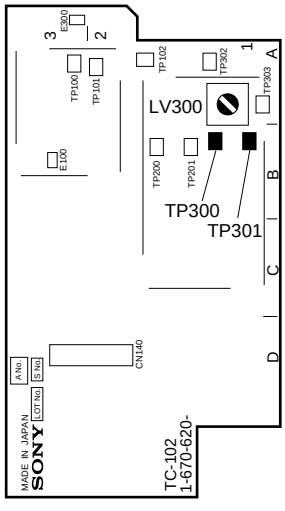
7-3-3. LTC Erasure Current Adjustment

Prepare the recording tape to perform this adjustment.

Measuring equipment:

Audio level meter (V rms measurement mode)
Oscilloscope

1. Connect the audio level meter to TP301(B-1) on the TC-102 board.
   GND: TP300/TC-102(B-1)
2. Insert the recording tape, then put into the recording mode.
3. Check the level on the audio level meter.
   Adj. point: ⊘LV300/TC-102(A-1)
   Specification: Maximum (110 mV rms or more: OK)
4. Disconnect the audio level meter and connect the oscilloscope to the same test point.
5. Check that no distortion is watched on the waveform.
6. Eject the recording tape.



TC-102 Board (Side A)

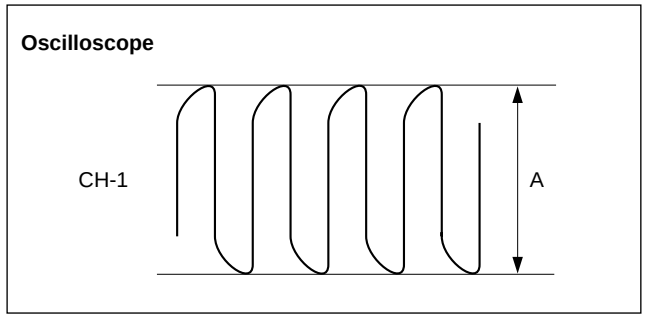
7-3-4. LTC PB Level Check

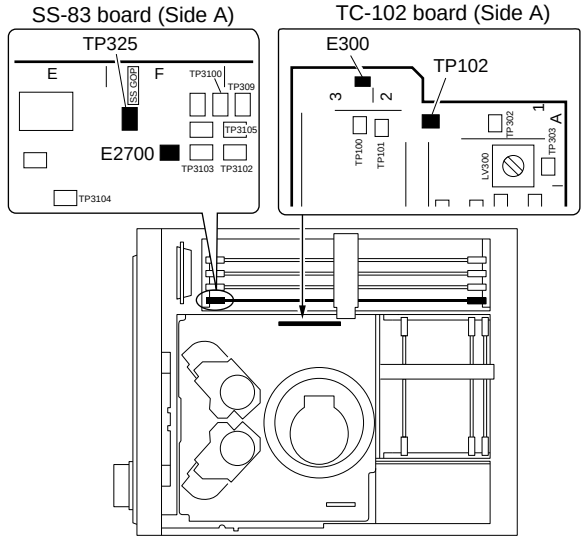
Prepare the following alignment tape to perform this adjustment.
DNW-75: SR5-1
DNW-75P: SR5-1P

Measuring equipment: Oscilloscope

1. Connect and set the oscilloscope as follows:
   CH-1: TP102/TC-102(A-2),
   GND: E300/TC-102(A-3), DC 100 mV/DIV
   TRIG: TP325/SS-83(A-1), GND: E2700/SS-83 (A-1)
   TIME: 100 µs/DIV
2. Insert the alignment tape SR5-1 or SR5-1P.
3. During play back the alignment tape in following PB modes, check the level on the oscilloscope in each PB mode.
   PB modes: PLAY, REW,
   SHUTTLE (−5 times speed),
   SHUTTLE (−0.21 time speed)
   Specification: A ≧ 180 mV p-p (in each PB mode)

If the above specification is not satisfied, perform “6-1. Tape Path Adjustment” again.



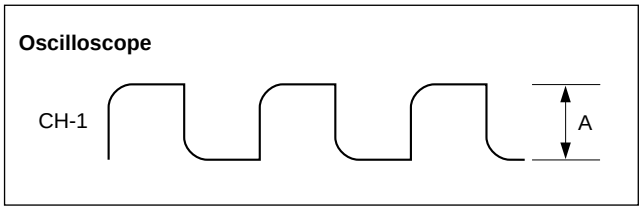


7-3-5. LTC OA Check

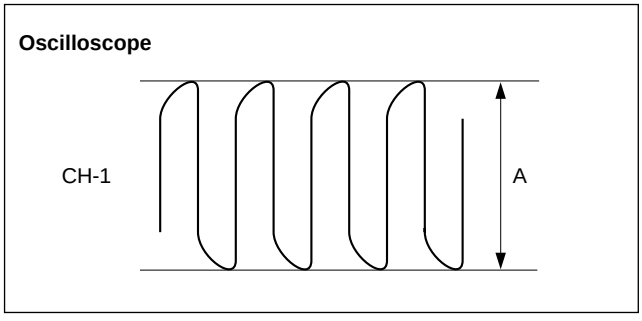
Prepare the recording tape to perform this adjustment.

Measuring equipment: Oscilloscope
Time code generator
Time code reader

1. Connect the output of the time code generator to TIME CODE IN connector of the DNW.
2. Connect and set the oscilloscope as follows:
   CH-1: TP100/TC-102(A-2),
   GND: TP101/TC-102(A-3), DC 100 mV/DIV
   TRIG: TP325/SS-83(F-1), GND: E2700/SS-83 (F-1)
   TIME: 100 µs/DIV
3. Insert the recording tape.
4. Check the level in recording mode.
   Specification: 60 ±5 mV p-p



5. Connect the input of the time code reader to TIME CODE OUT connector of the DNW.
6. Change the connection of oscilloscope as follows:
   CH-1: TP102/TC-102(A-2)
   GND: E300/TC-102(A-3)
7. During play back the recorded portion at step 4 in PLAY mode, check that the time code can be read on the time code reader.
8. During play back the recorded portion at step 4 in following PB modes, check each level on the oscilloscope.
   PB modes: PLAY, REW,
   SHUTTLE (−5 times speed),
   SHUTTLE (−0.21 time speed)
   Specification: A ≧ 180 mV p-p (in each PB mode)

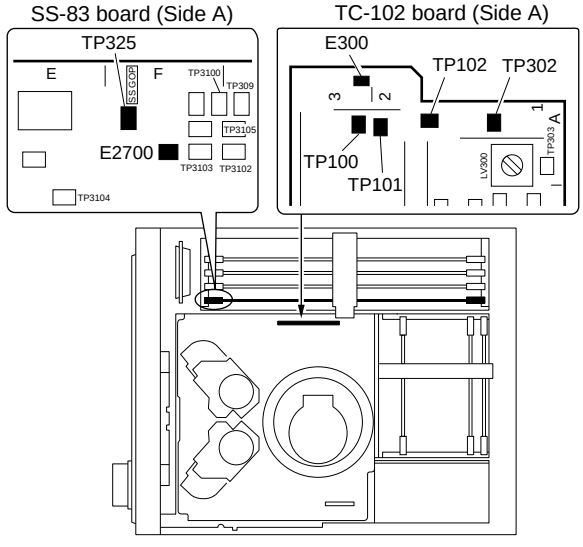


7-3-6. LTC Erase Ratio Check

Prepare the recording tape to perform this adjustment.

Measuring equipment:
Audio signal generator
Audio level meter (dB ratio measurement mode)
Band-pass filter (1 kHz)

1. Set following selectors of TC GENERATOR selection on the upper control panel.
   INT/EXT select: EXT
   PRESET/REGEN select: PRESET
2. Feed the audio signal (1 kHz, +7 dBu) from the audio signal generator to TIME CODE IN connector of DNW. (0 dBu ≒ 0.775 V rms)
3. Insert the recording tape, then record for 30 seconds. (Record the audio signal to the time code track.)
4. Short-circuit TP302/TC-102(A-1) and E300/TC-102 (A-3) with a shorting clip.
5. Rewind the recorded portion by 15 seconds and record again. (Record the no signal to the time code track.)
6. Disconnect the shorting clip.
7. Connect the audio level meter through a 1 kHz band-pass filter to TP102/TC-102(A-2).
   GND: E300/TC-102(A-3)
8. During play back the audio-signal-recorded portion in PLAY mode, measure the PB level on the audio analyzer.
   This measured audio level is a reference level (0 dB).
9. During play back the no-signal-recorded portion in PLAY mode, check the PB level on the audio analyzer.
   Specification: −40 dB or less
   (Regard a level of the audio-signal-recorded portion as 0 dB.)



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SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers’ instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

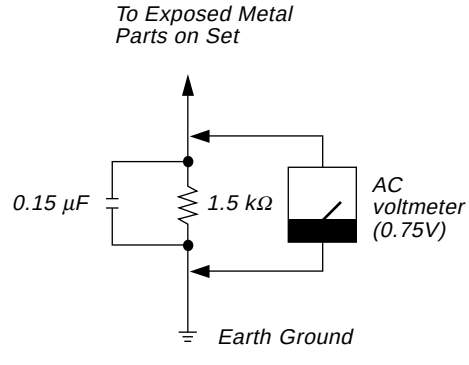

Fig A. Using an AC voltmeter to check AC leakage.

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DNW-75P (SY) E
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